

Nailing the Written Emergency Medicine Board Examination

Bobby Desai
Brandon R. Allen
Editors

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 Springer

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For my wife Katie and children Nila and Owen

–Brandon R. Allen

*For Alpa, Jayden, Dylan, and Shayan
Your support in this endeavor has been incredible*

–Bobby Desai

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Cardiovascular Emergencies

Bobby Desai

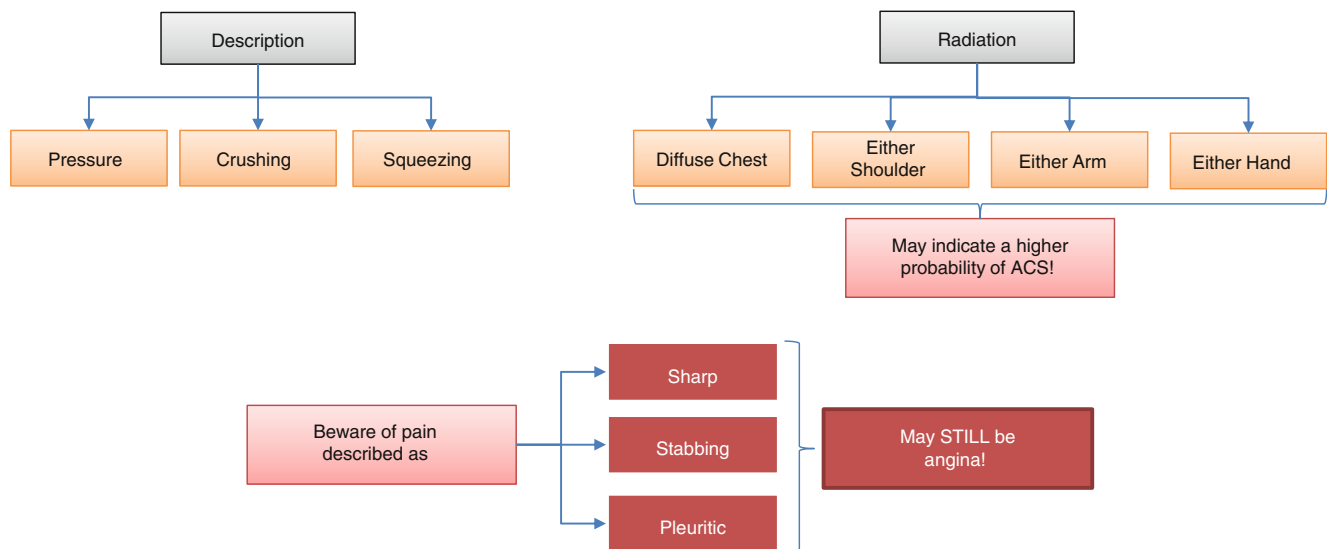
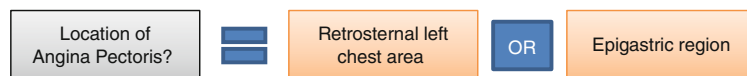
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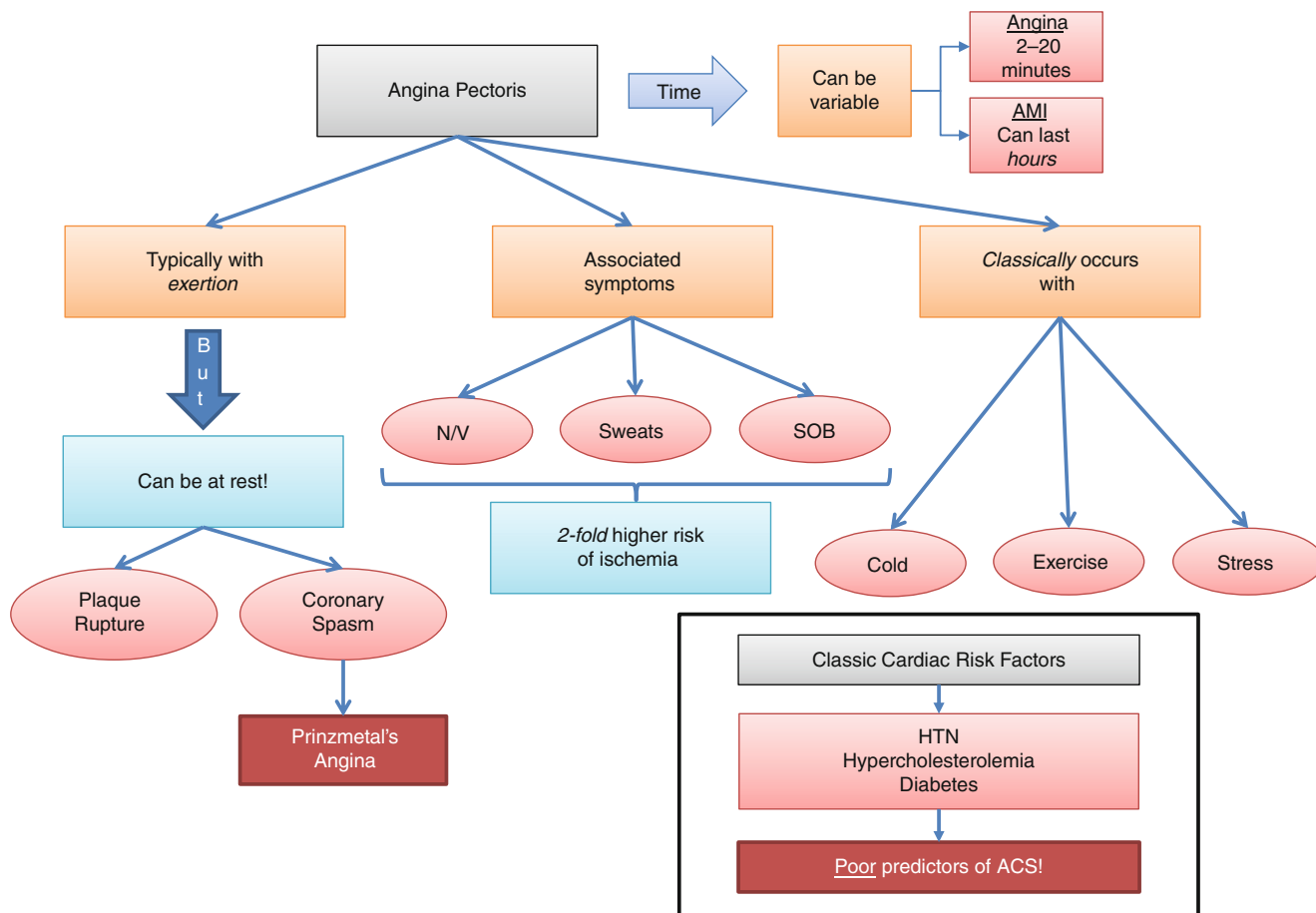
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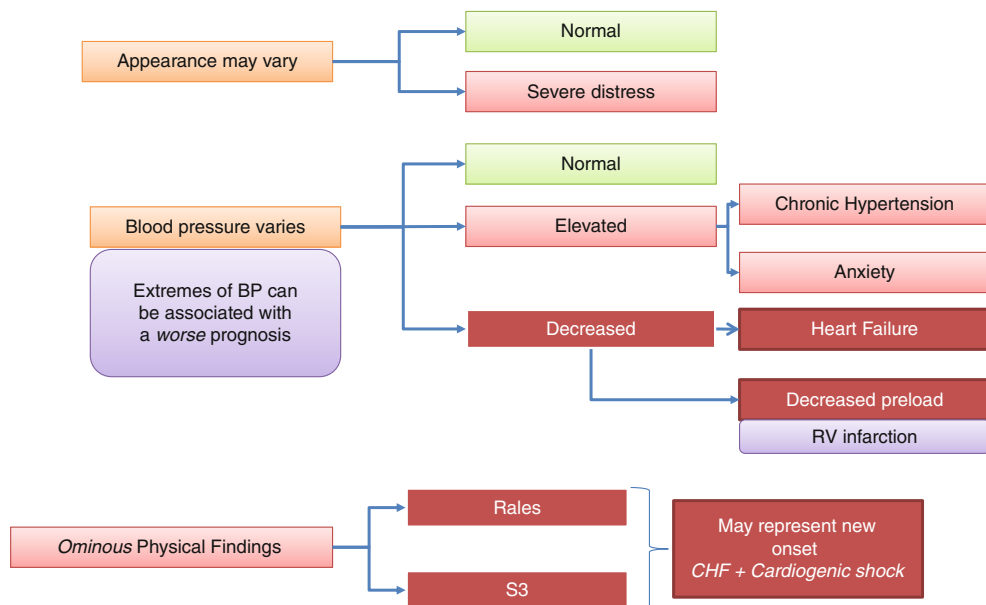
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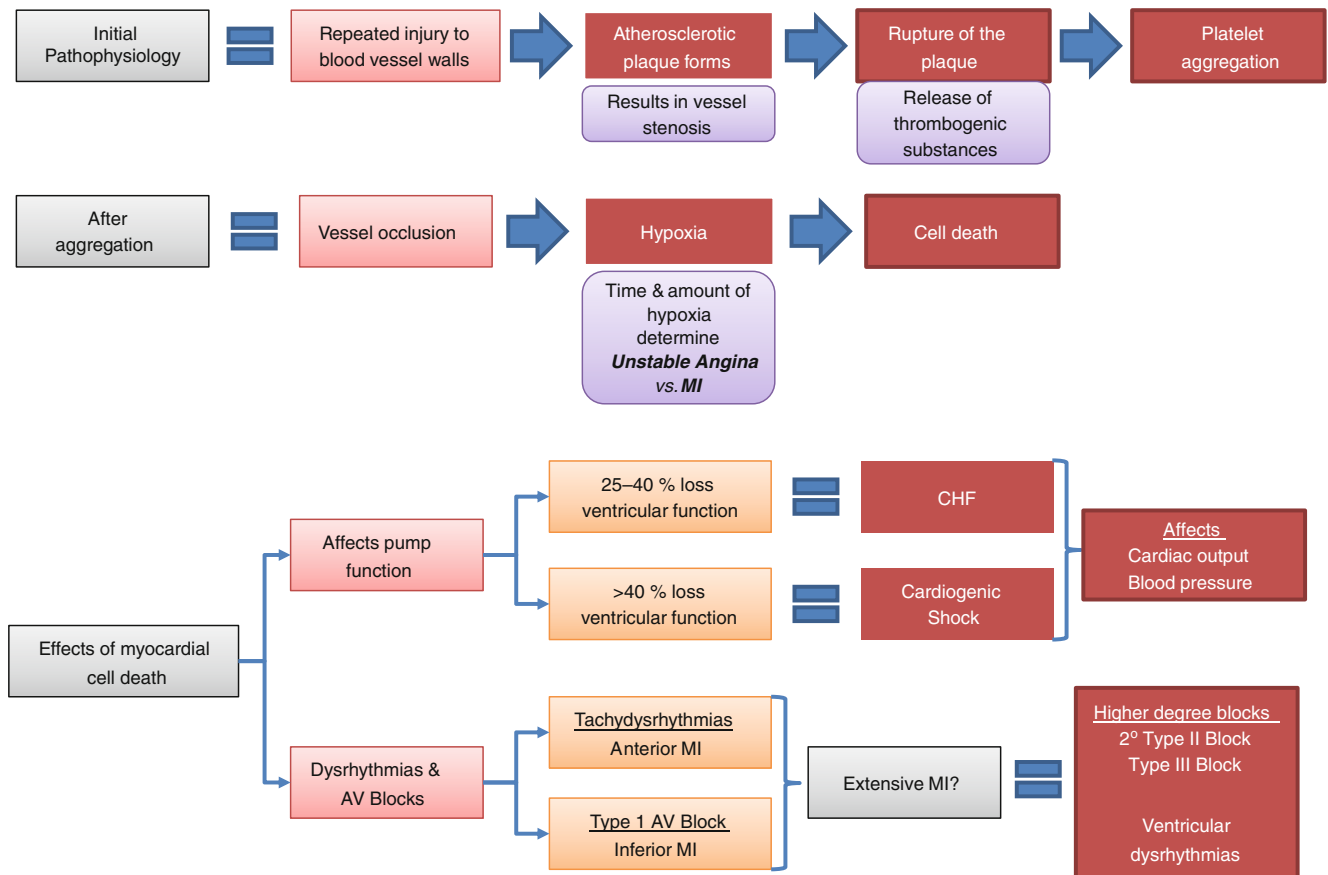
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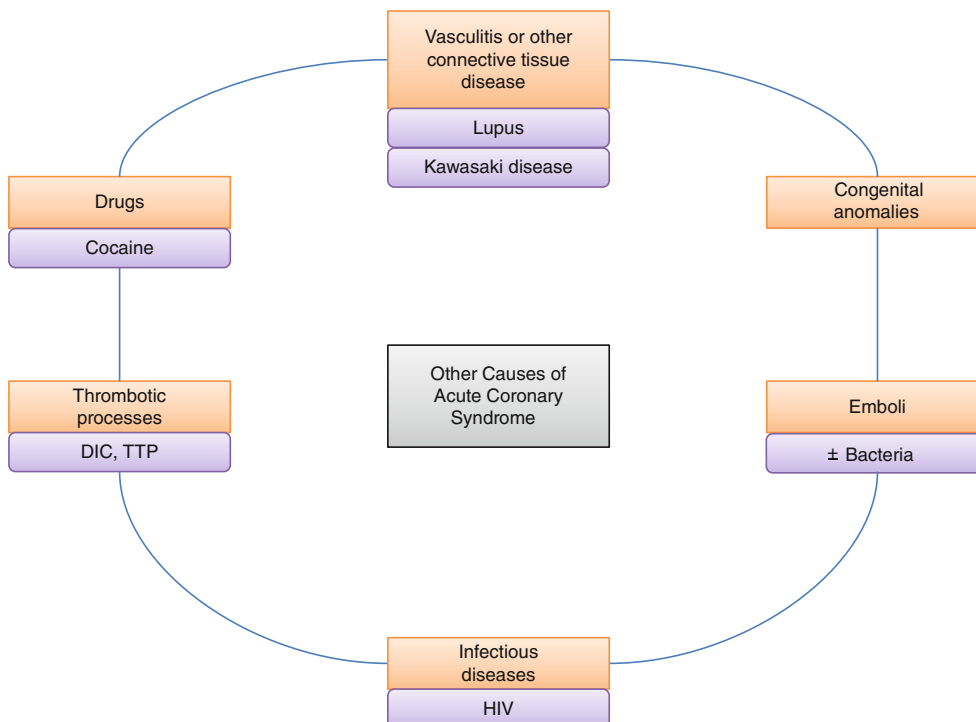
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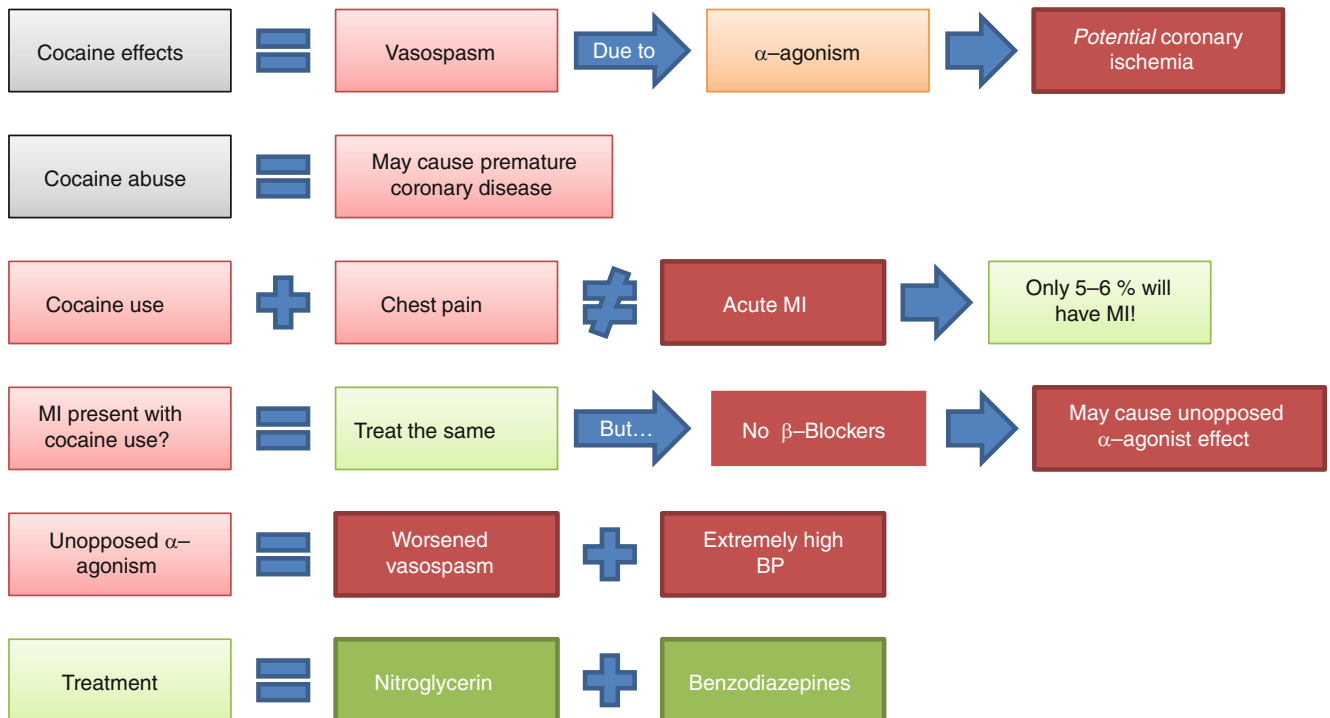
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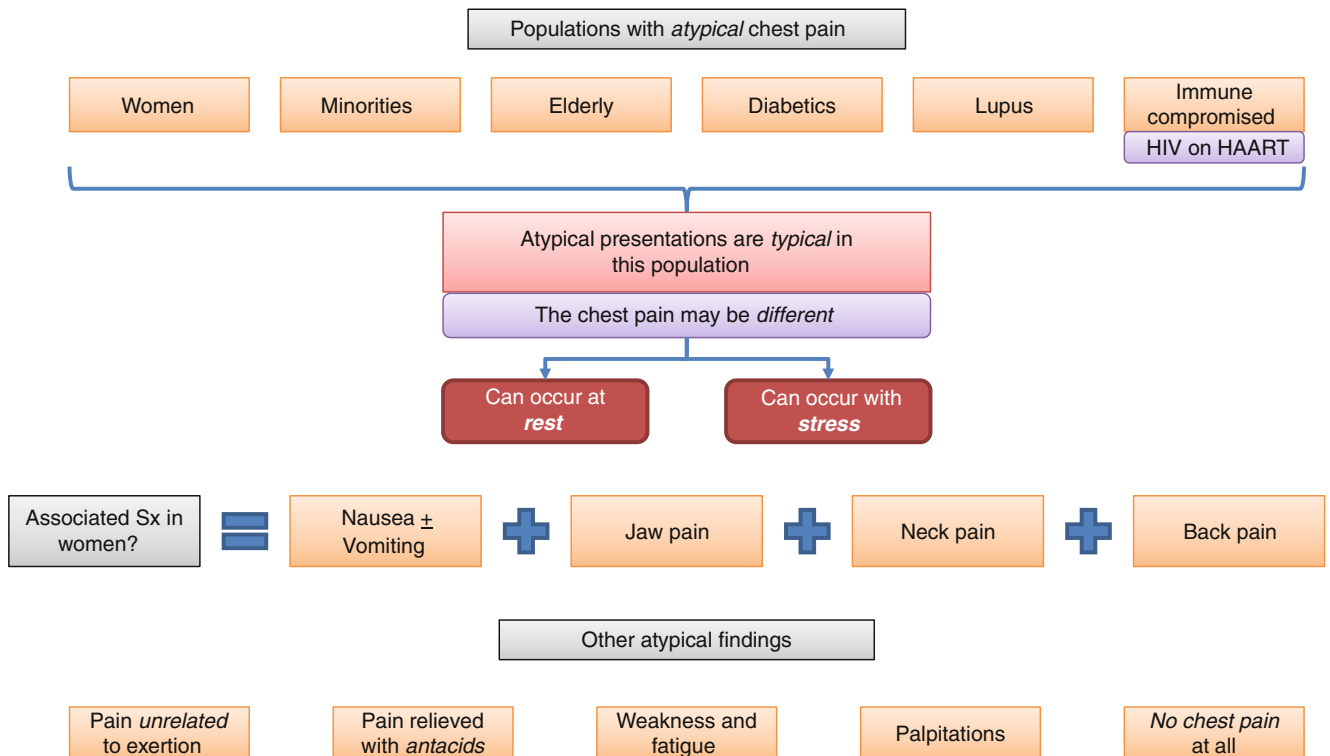
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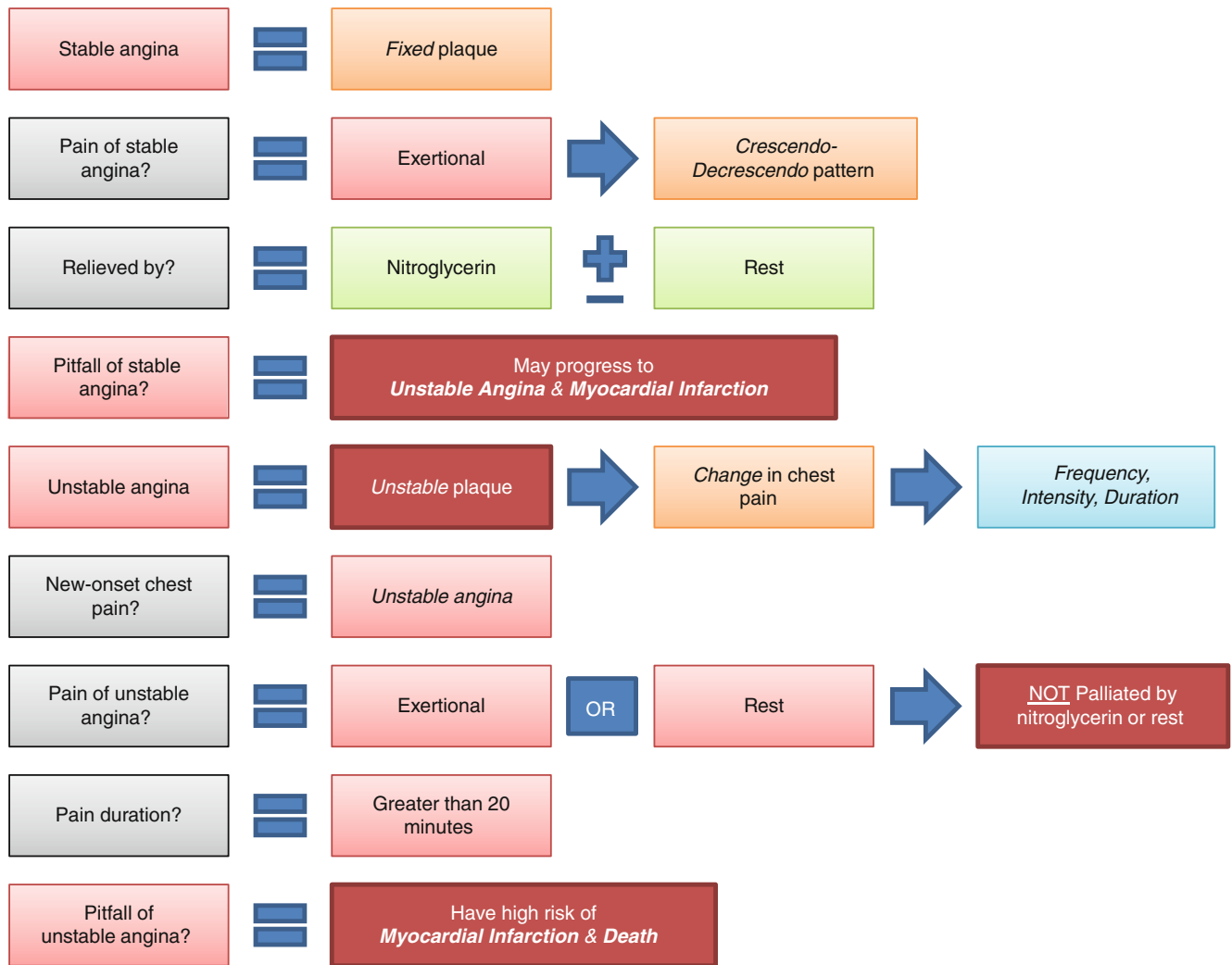
Cocaine and Chest Pain



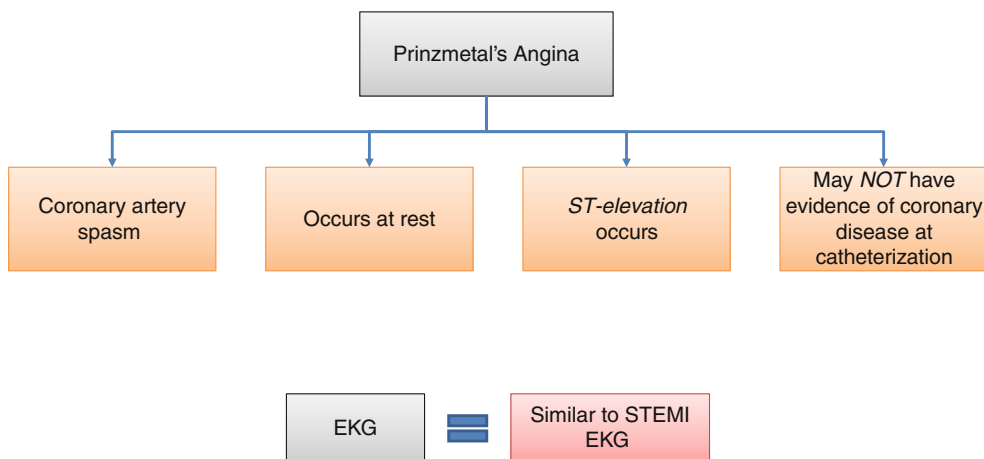
Atypical Chest Pain



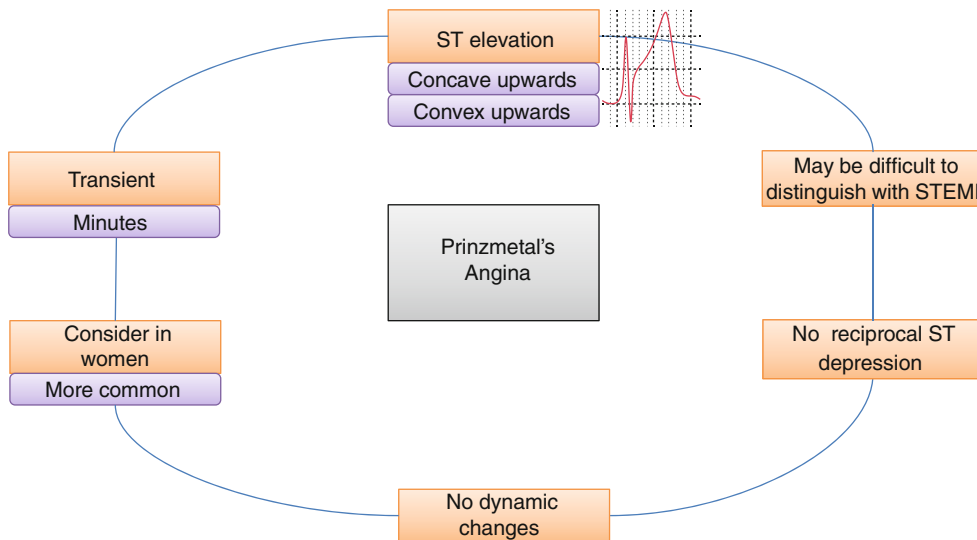
Stable and Unstable Angina



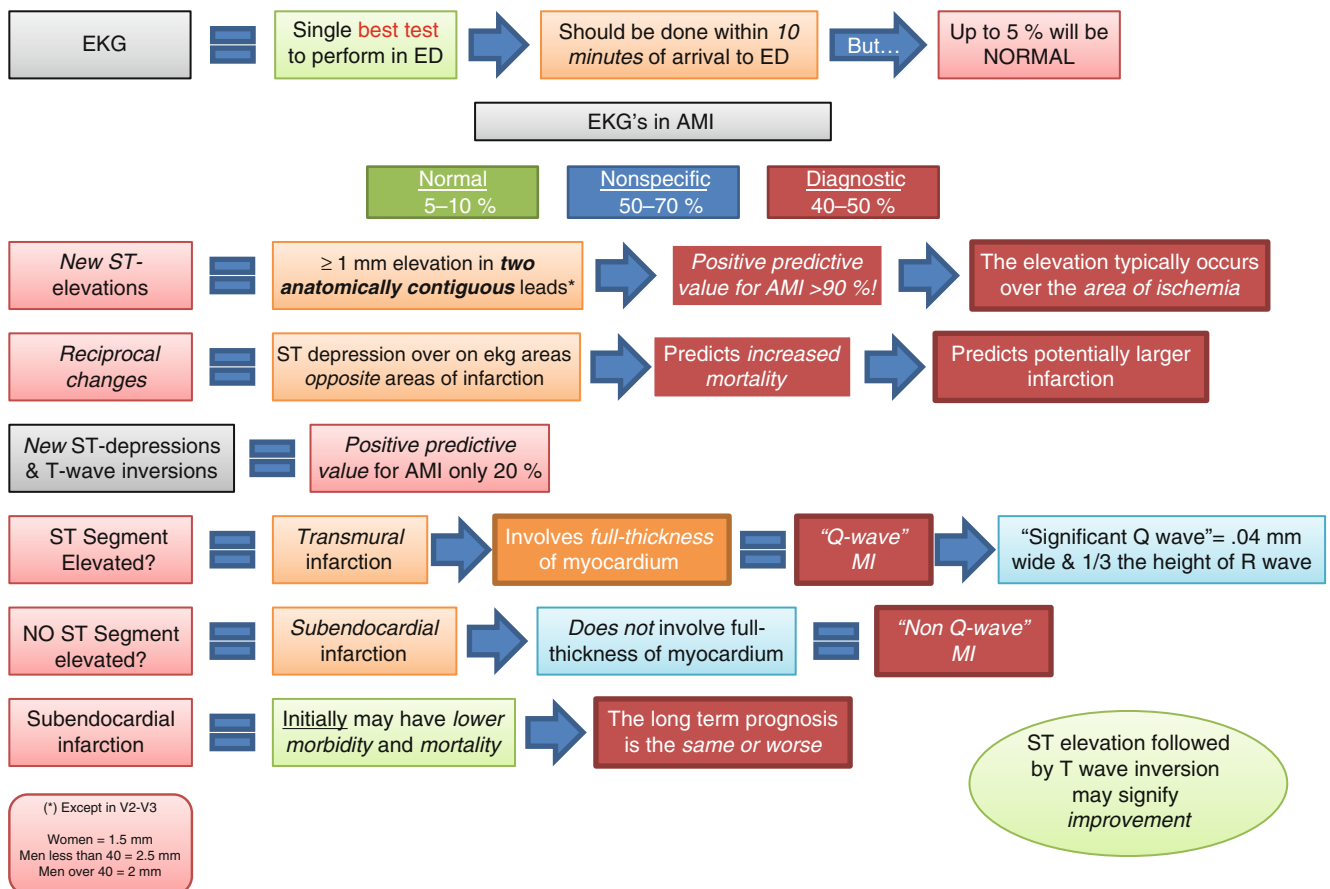
Prinzmetal's or Variant Angina



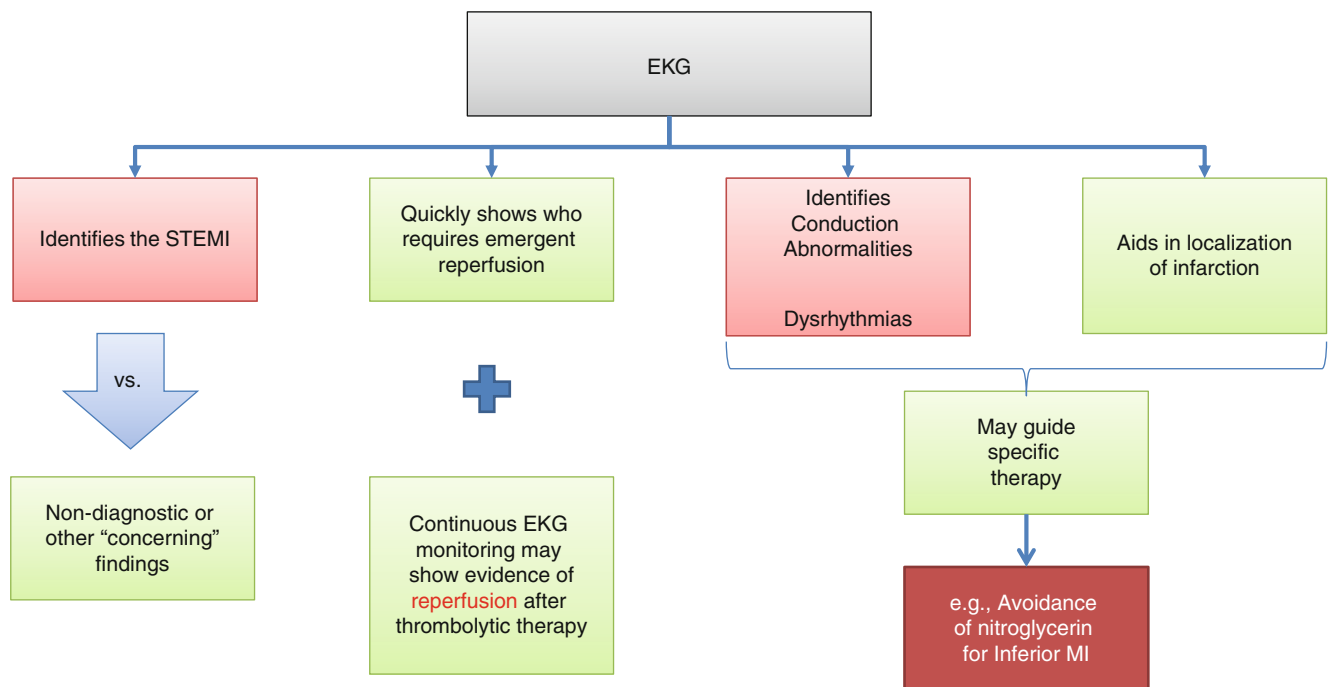
What Factors Predict Prinzmetal's Angina?



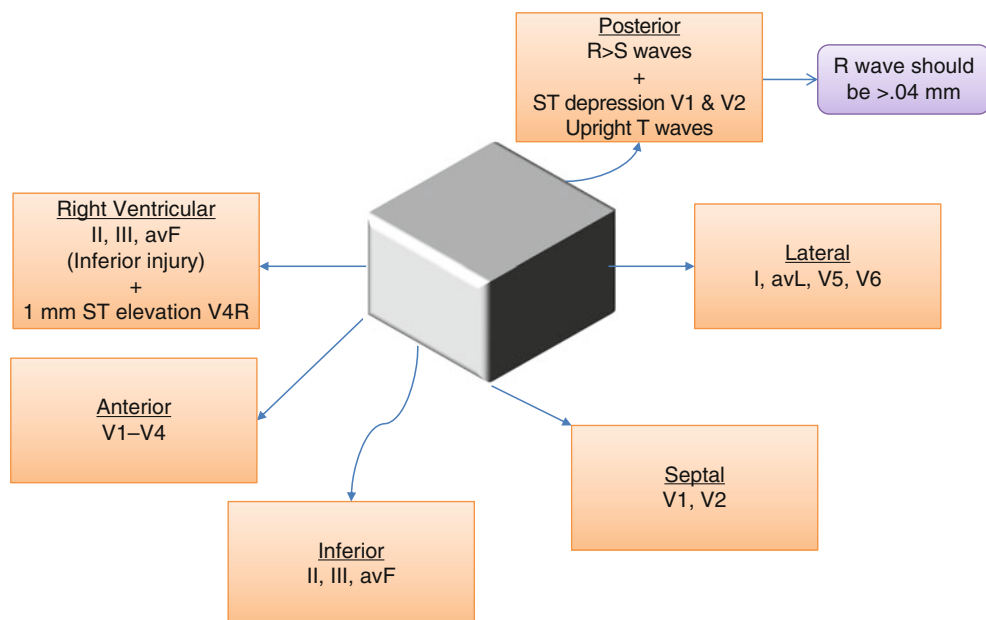
Acute Myocardial Infarction



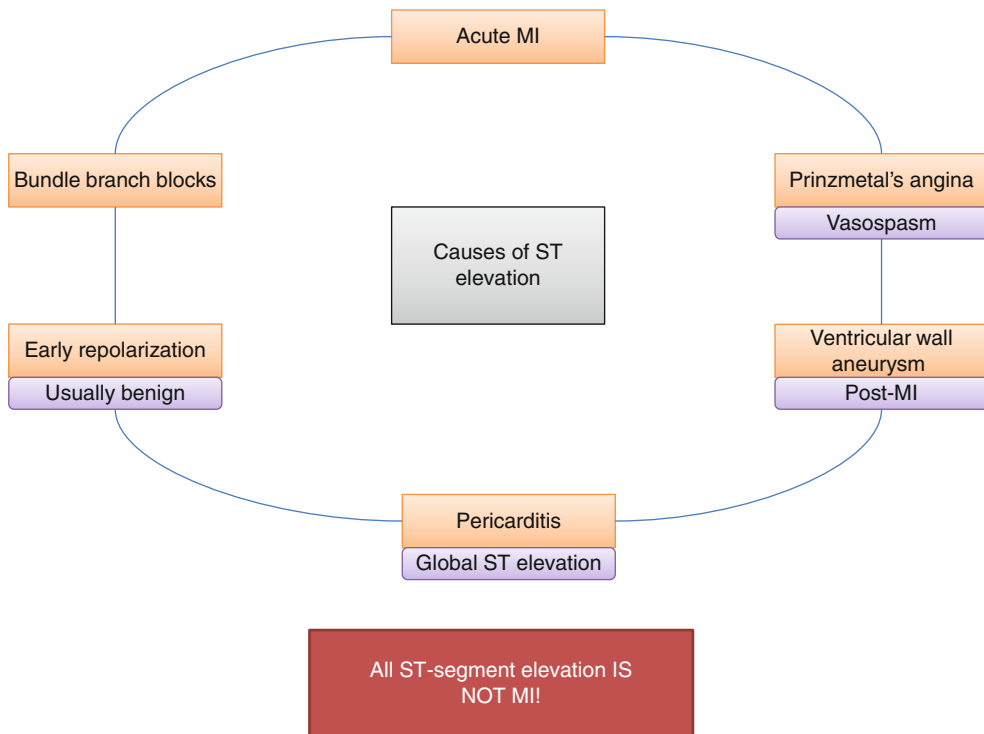
How Is the EKG Helpful?



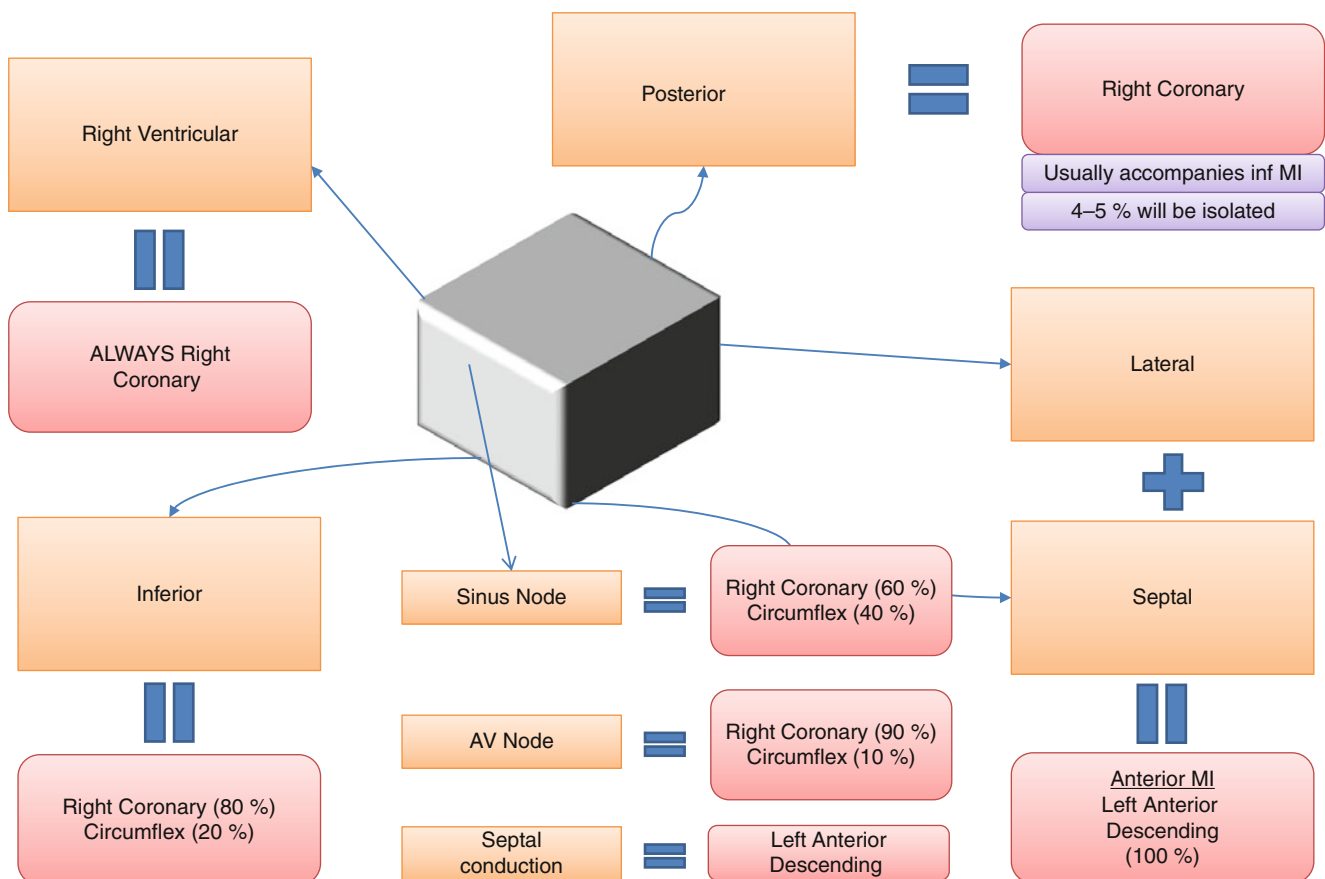
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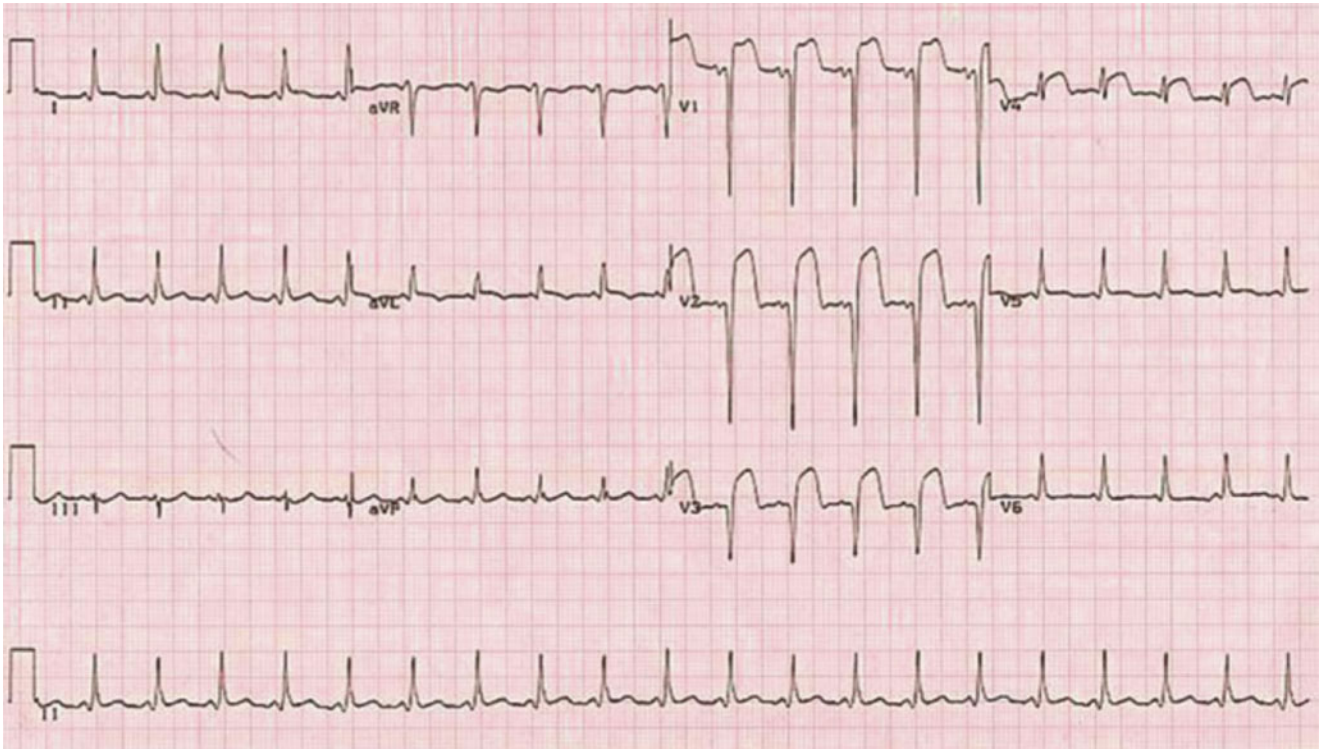
Causes of ST-Segment Elevation



Arteries and Affected Areas

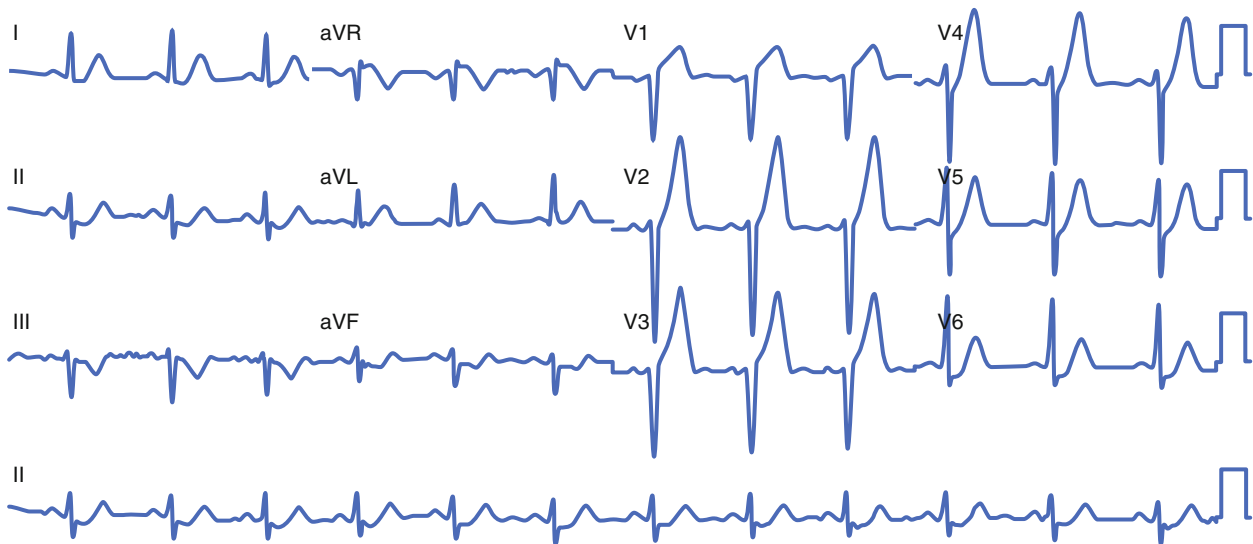


Anterior MI

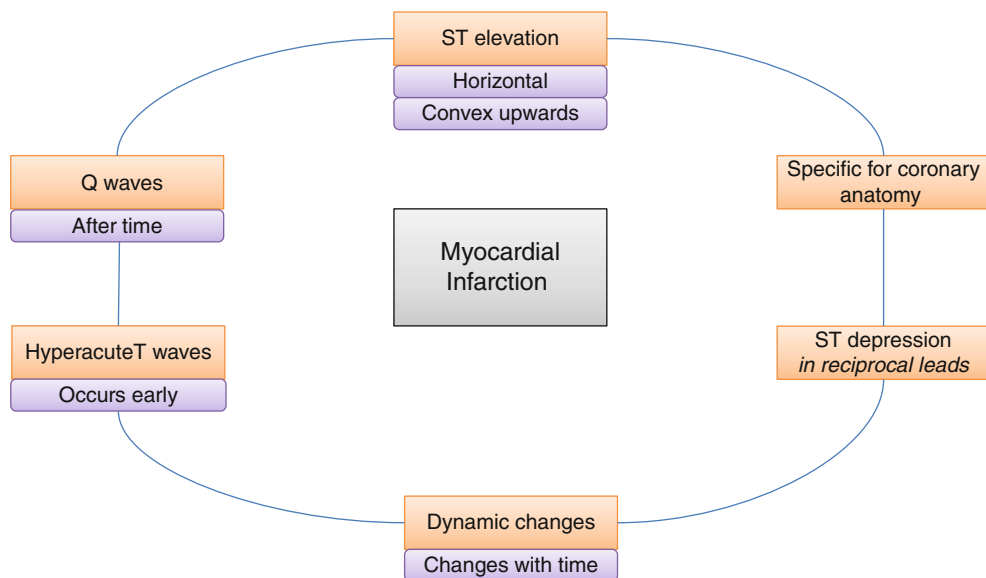


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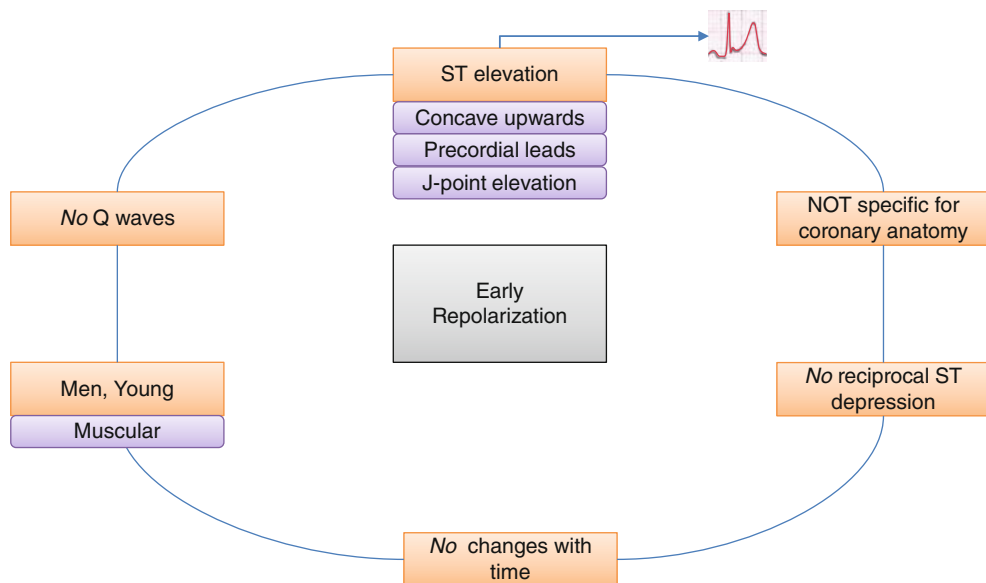
Hyperacute T Waves



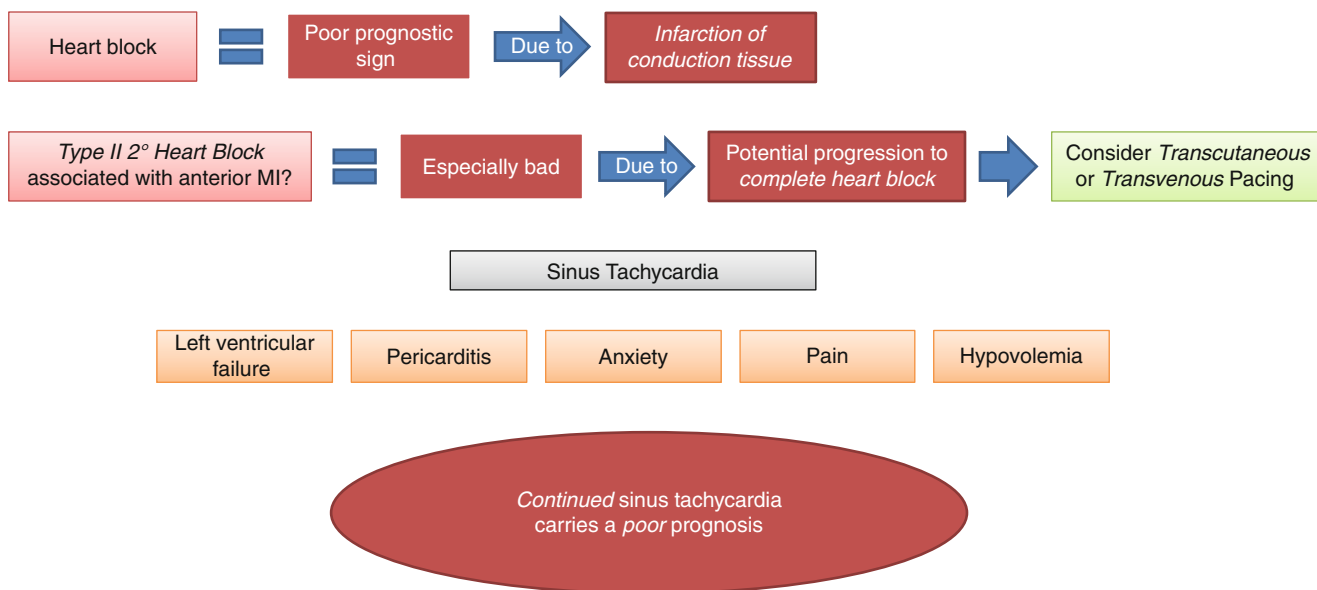
What Factors Predict MI on the EKG?



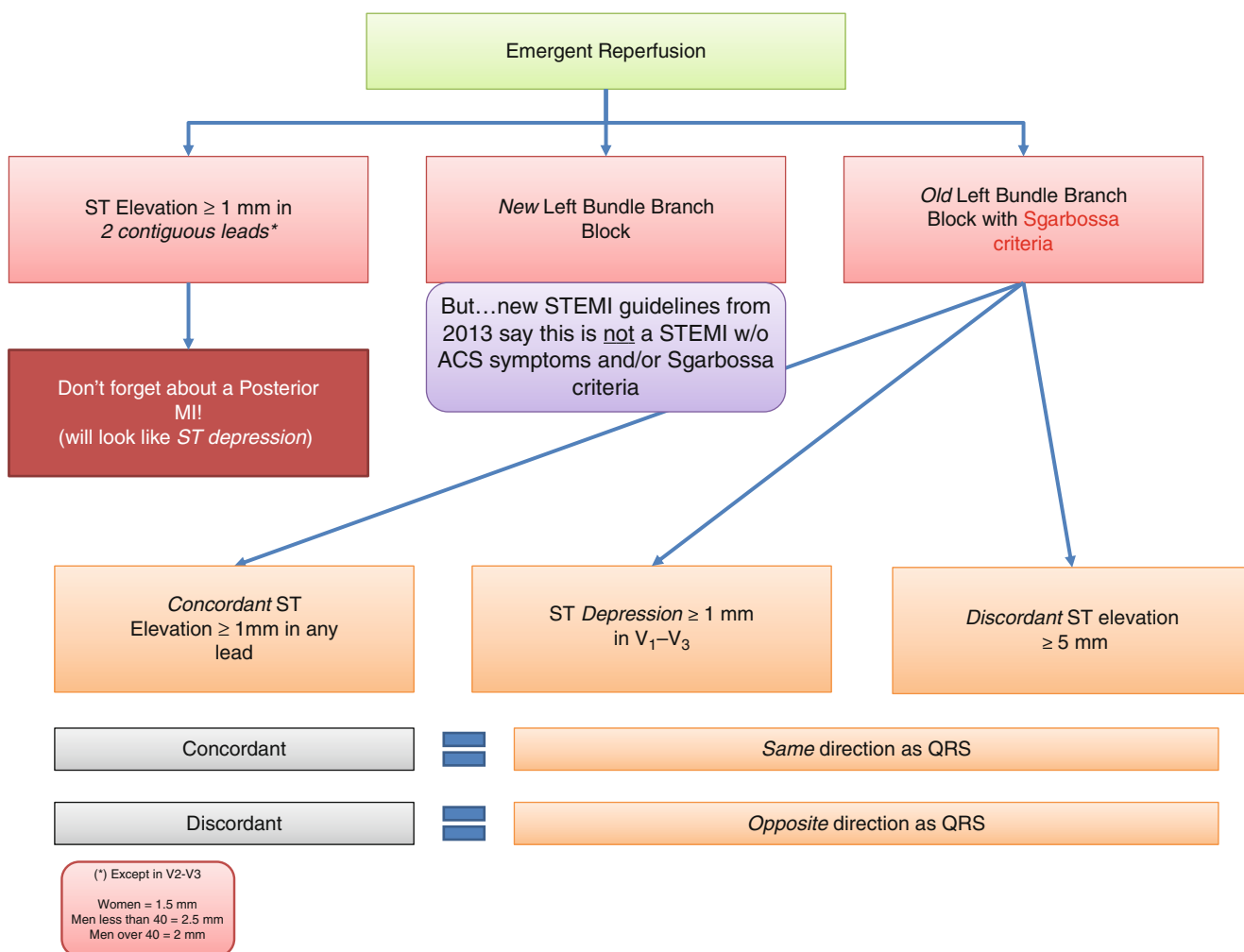
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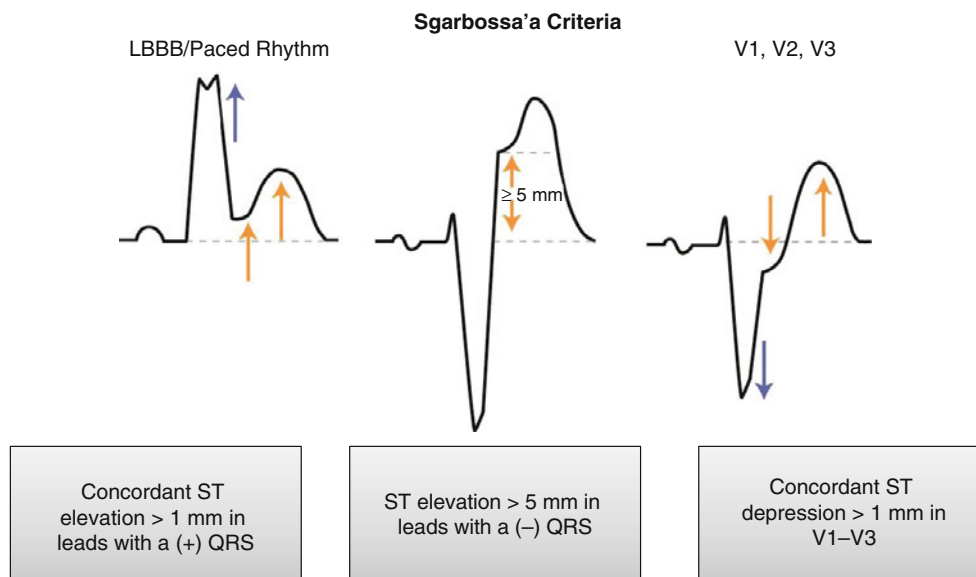
Anterior MI Specifics



The EKG and Emergent Reperfusion

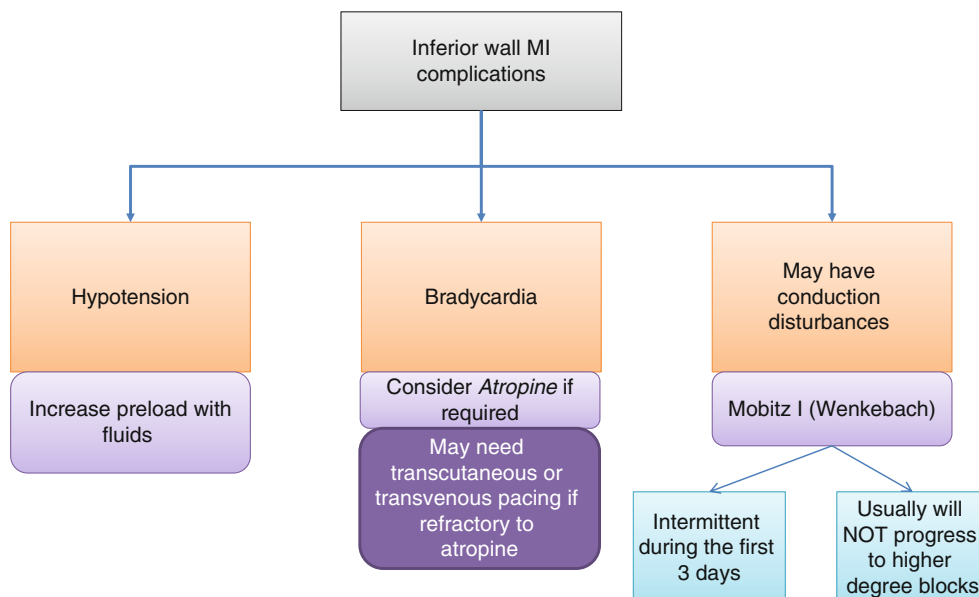


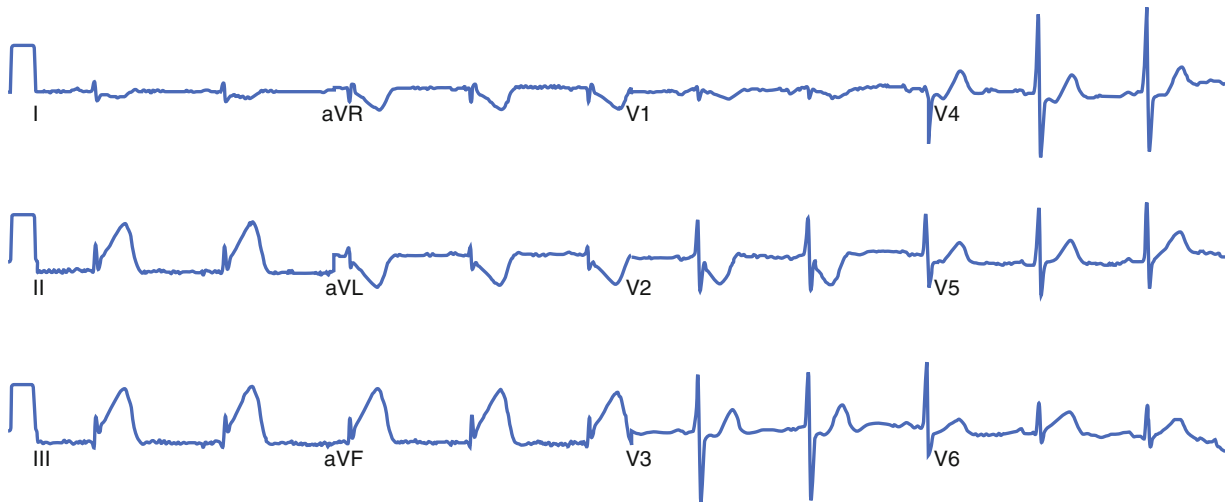
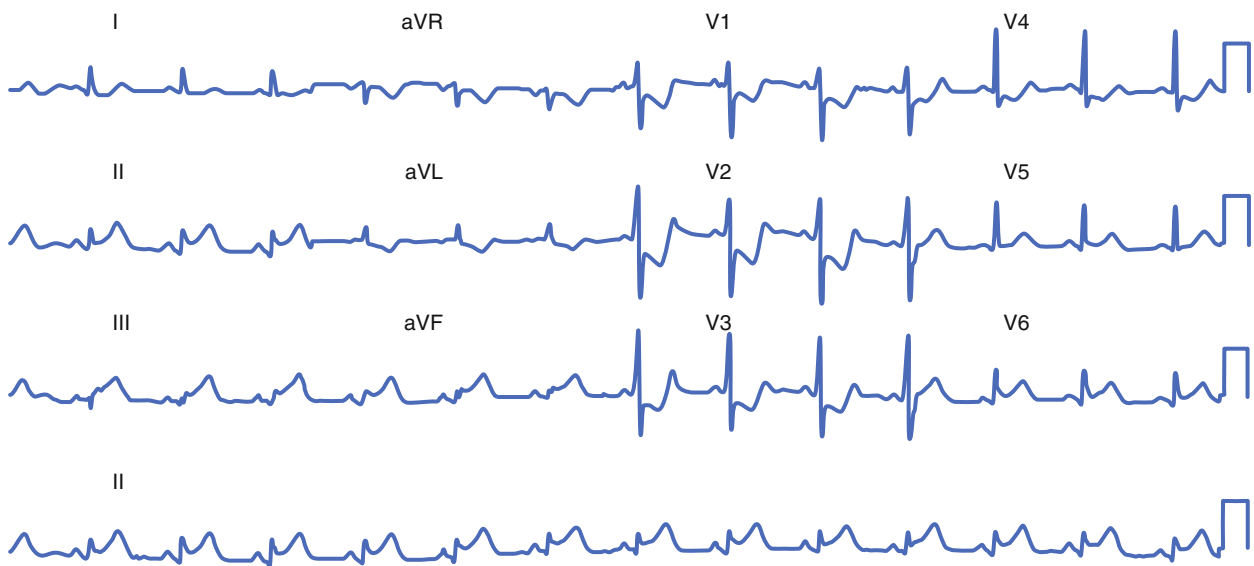
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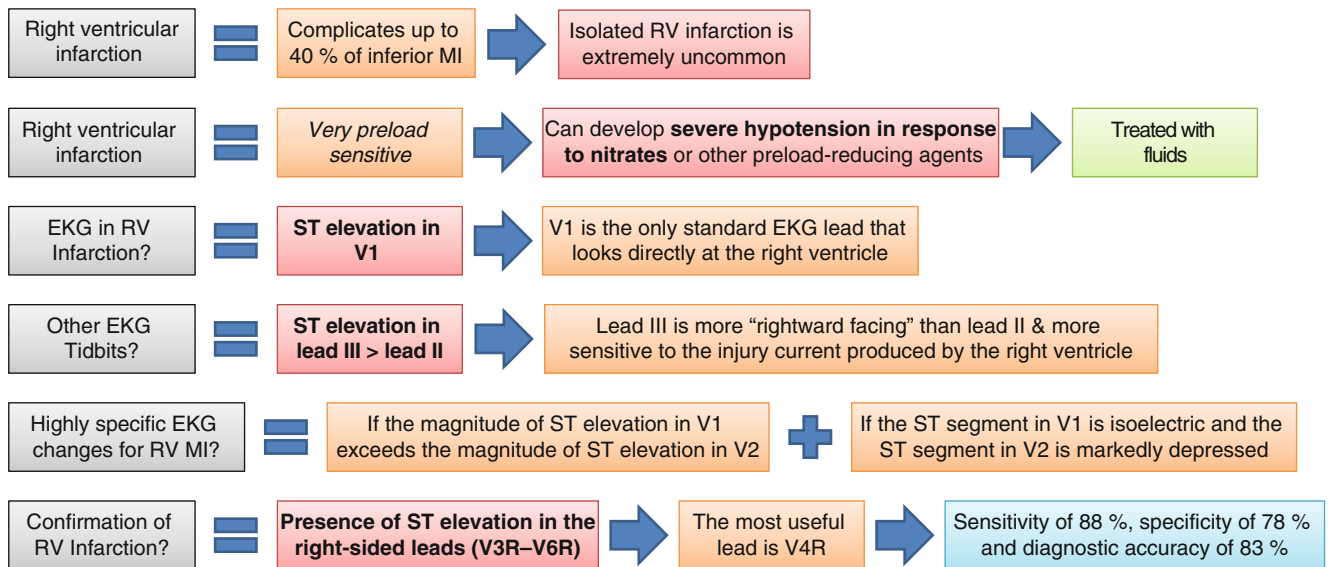
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Inferior MI Specifics

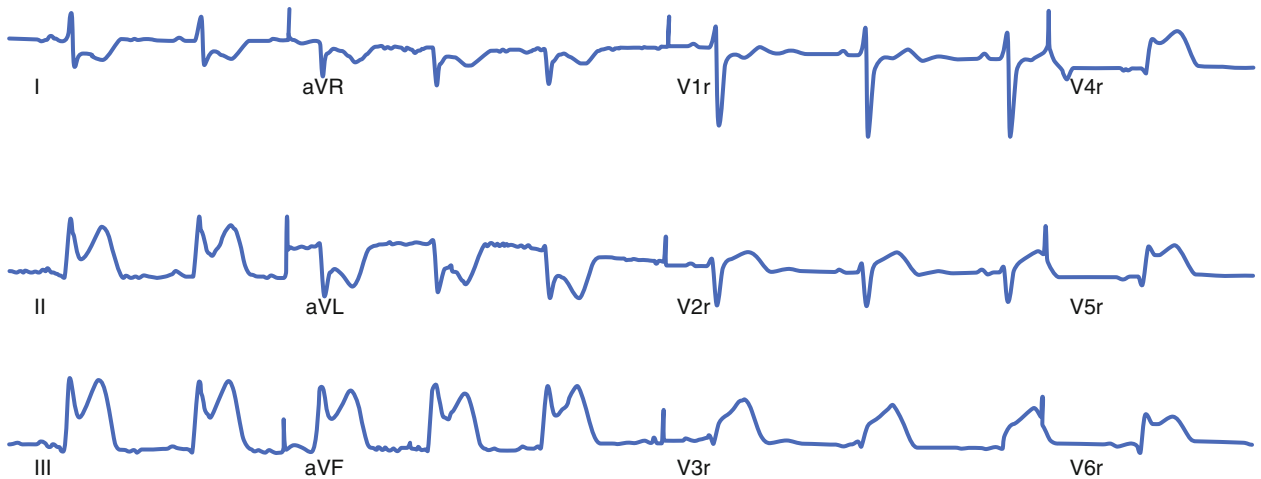


Inferior MI**Inferior-Posterior MI**

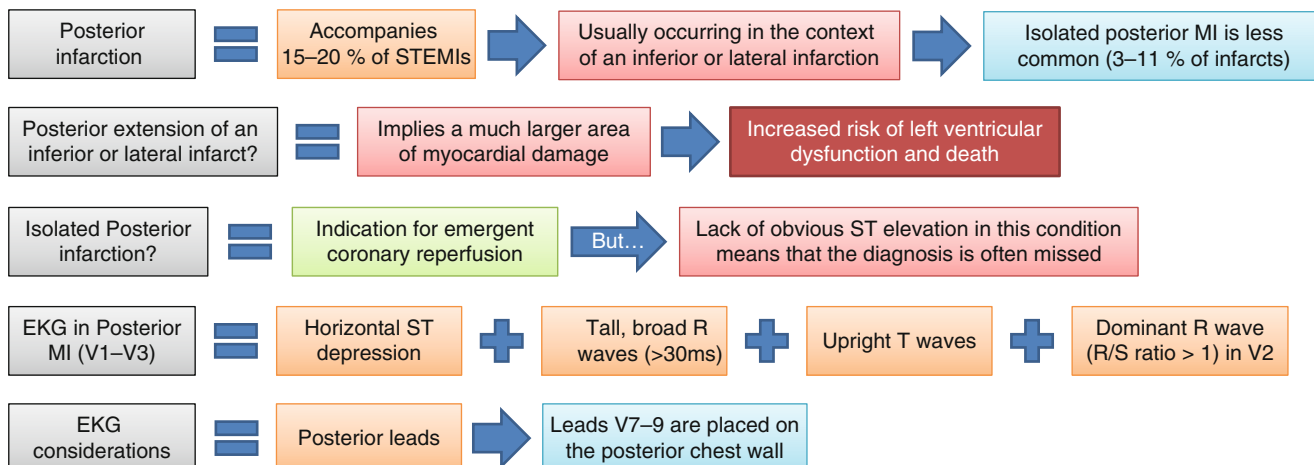
Right Ventricular Infarction



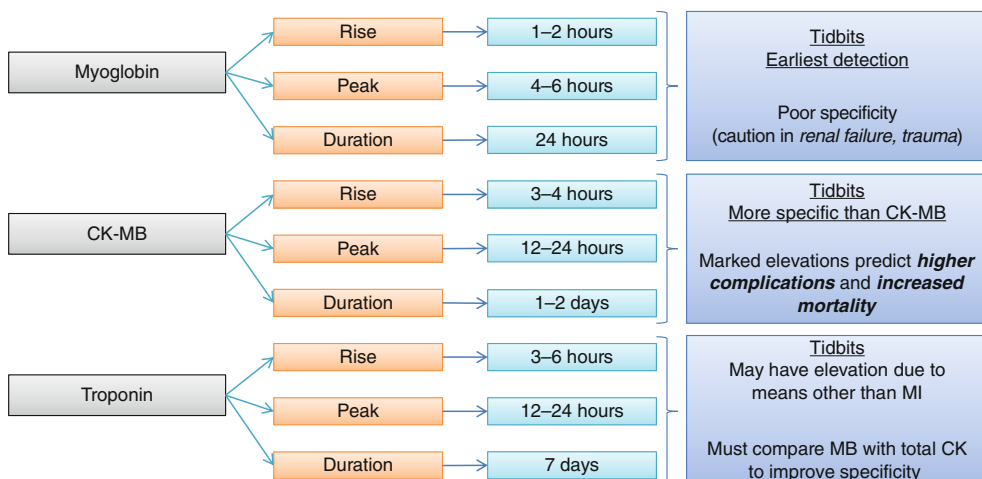
Right Ventricular Infarction



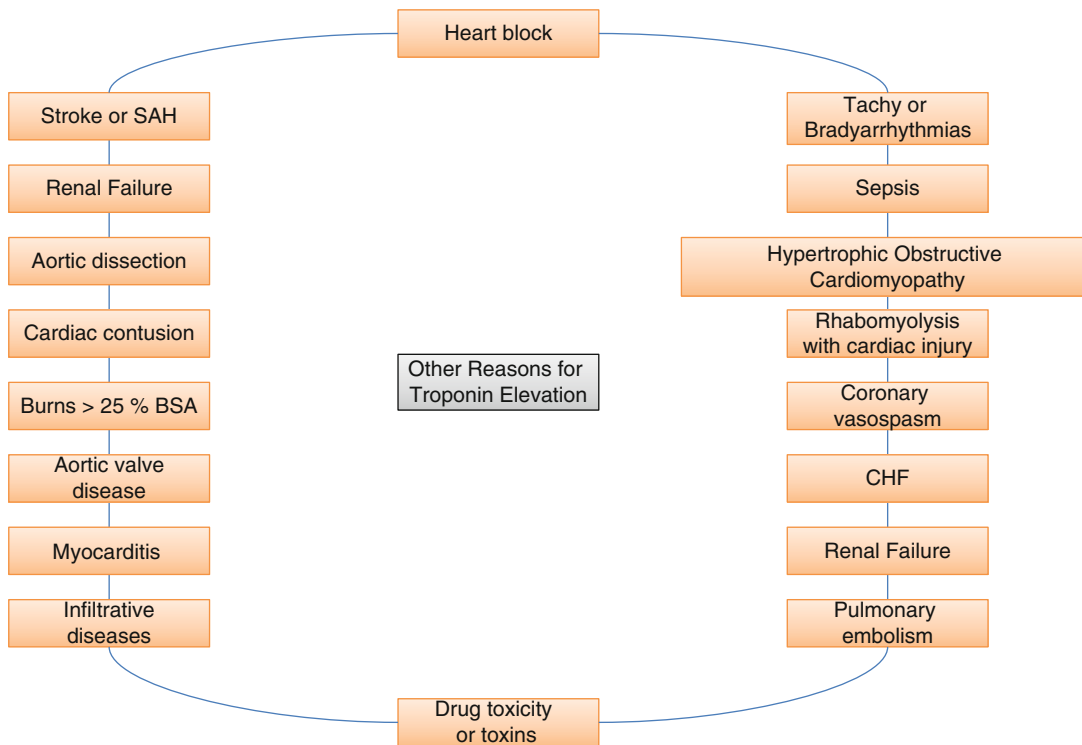
Posterior Infarction



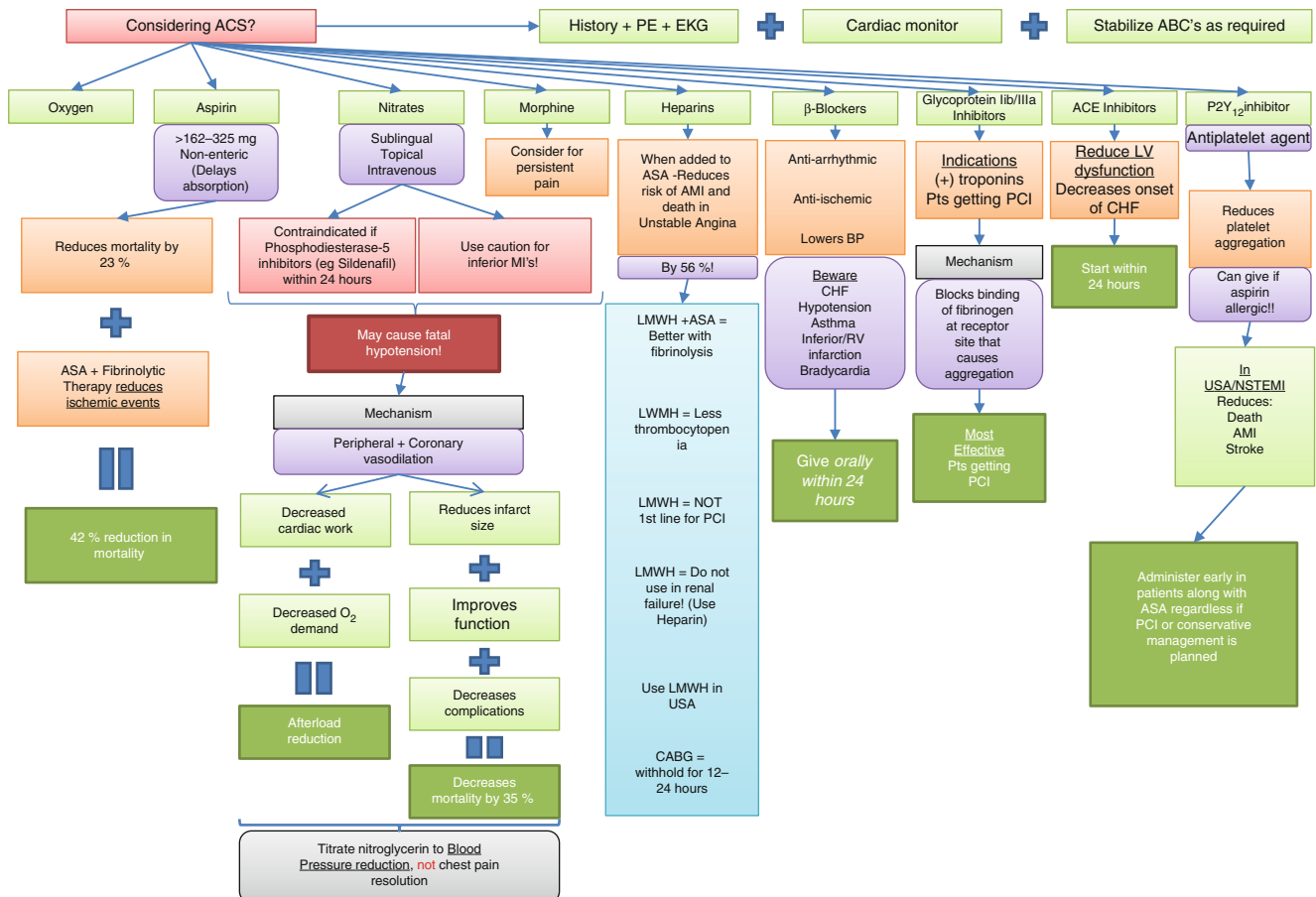
Cardiac Markers



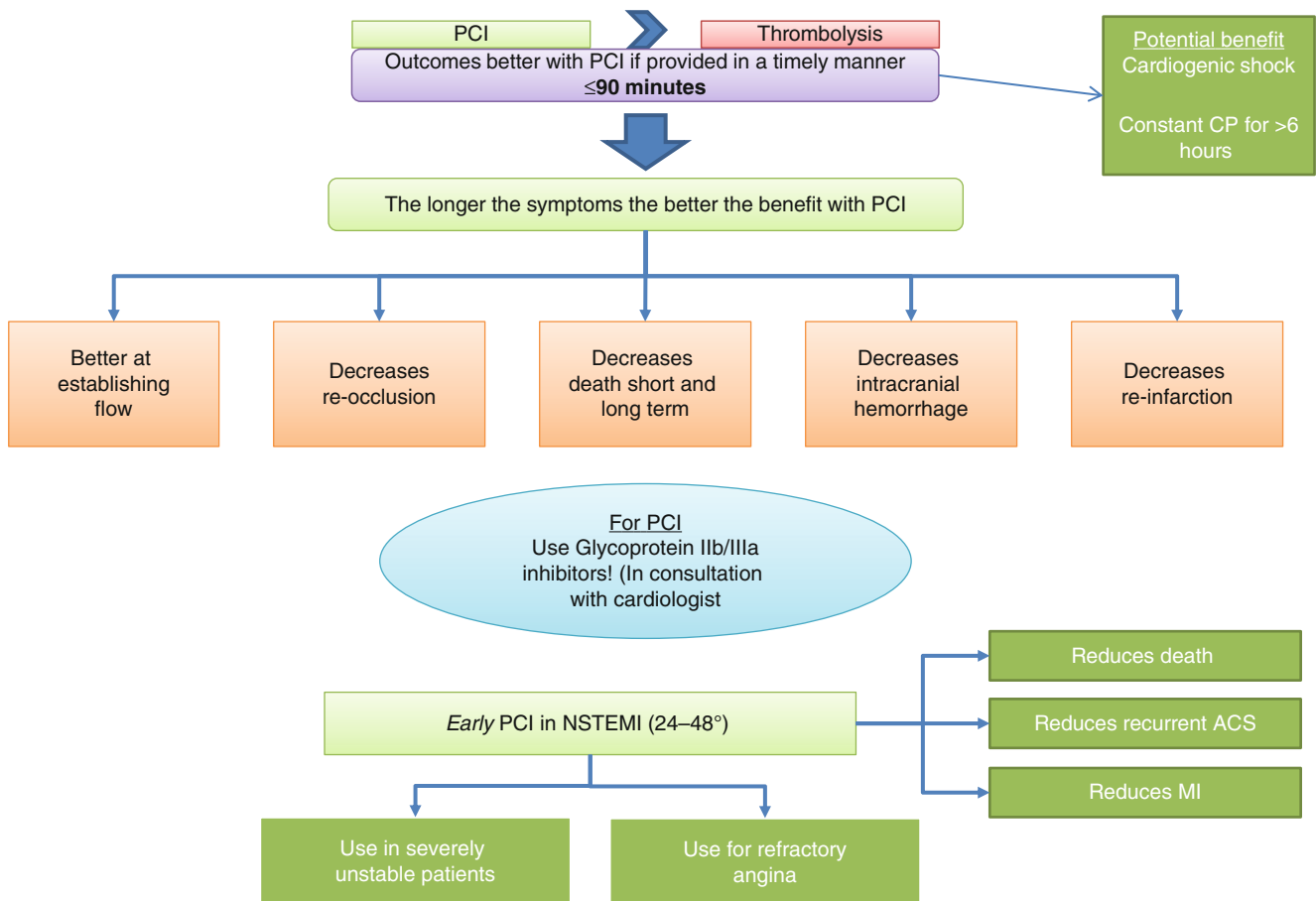
Other Reasons for Troponin Elevation



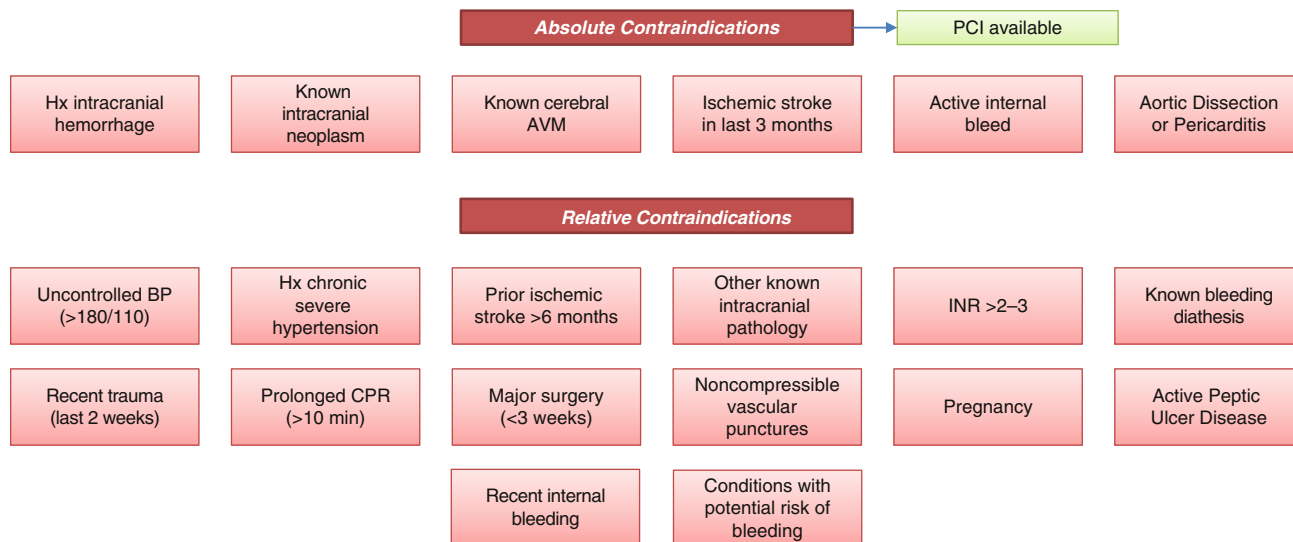
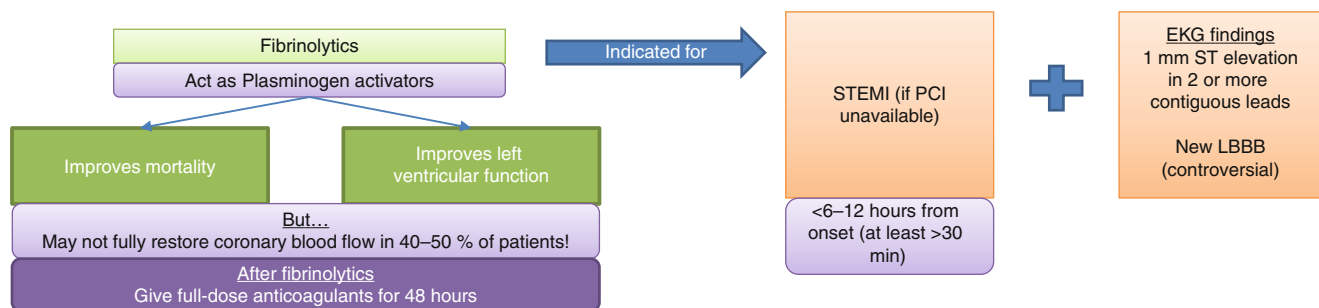
Initial Therapy for ACS



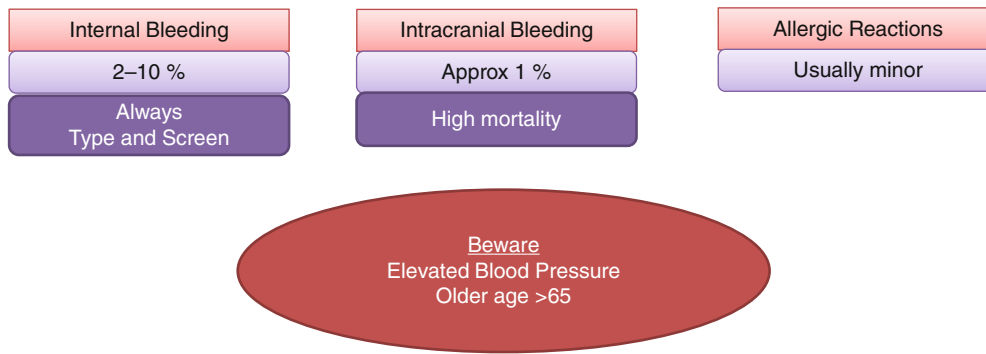
Reperfusion in AMI



Reperfusion in AMI (2)



Thrombolytic Therapy Complications



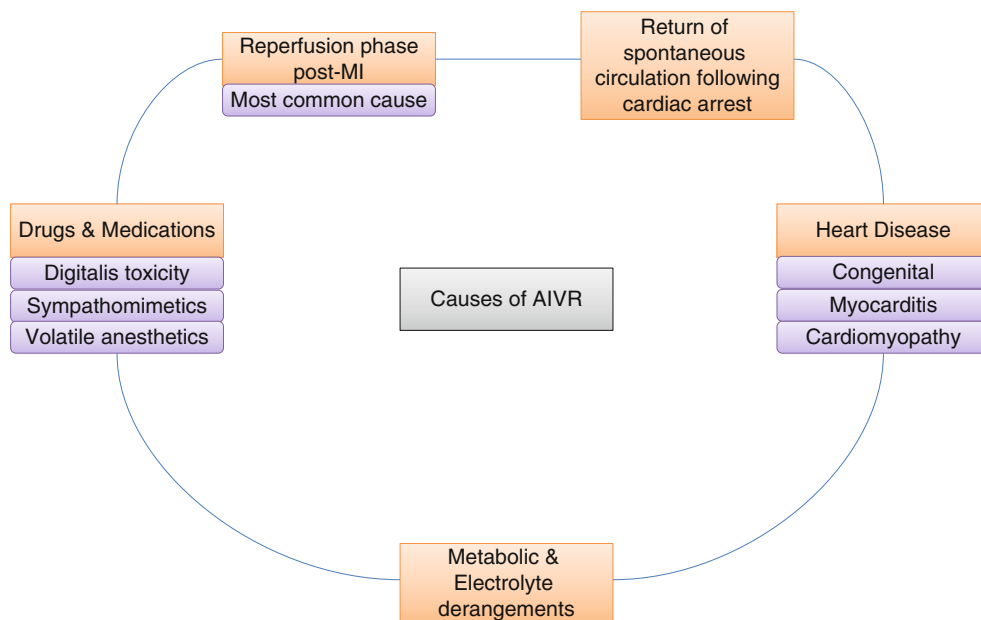
Successful Thrombolytic Therapy



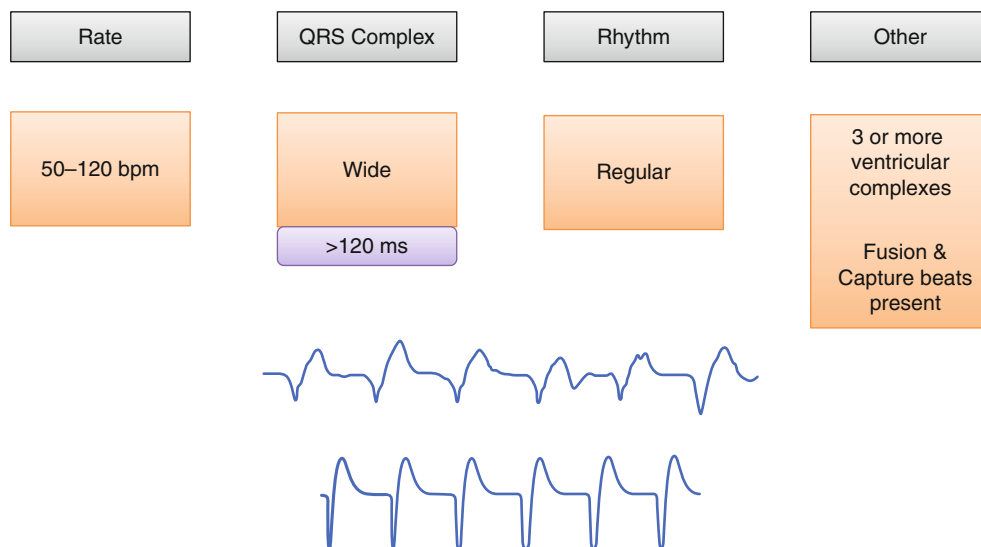
Successful Thrombolytic Therapy



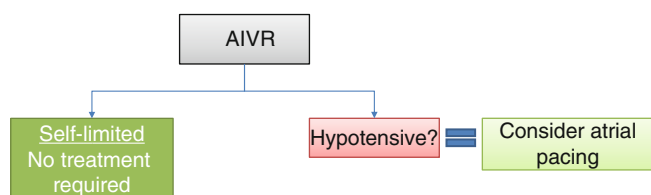
Accelerated Idioventricular Rhythm (AIVR)



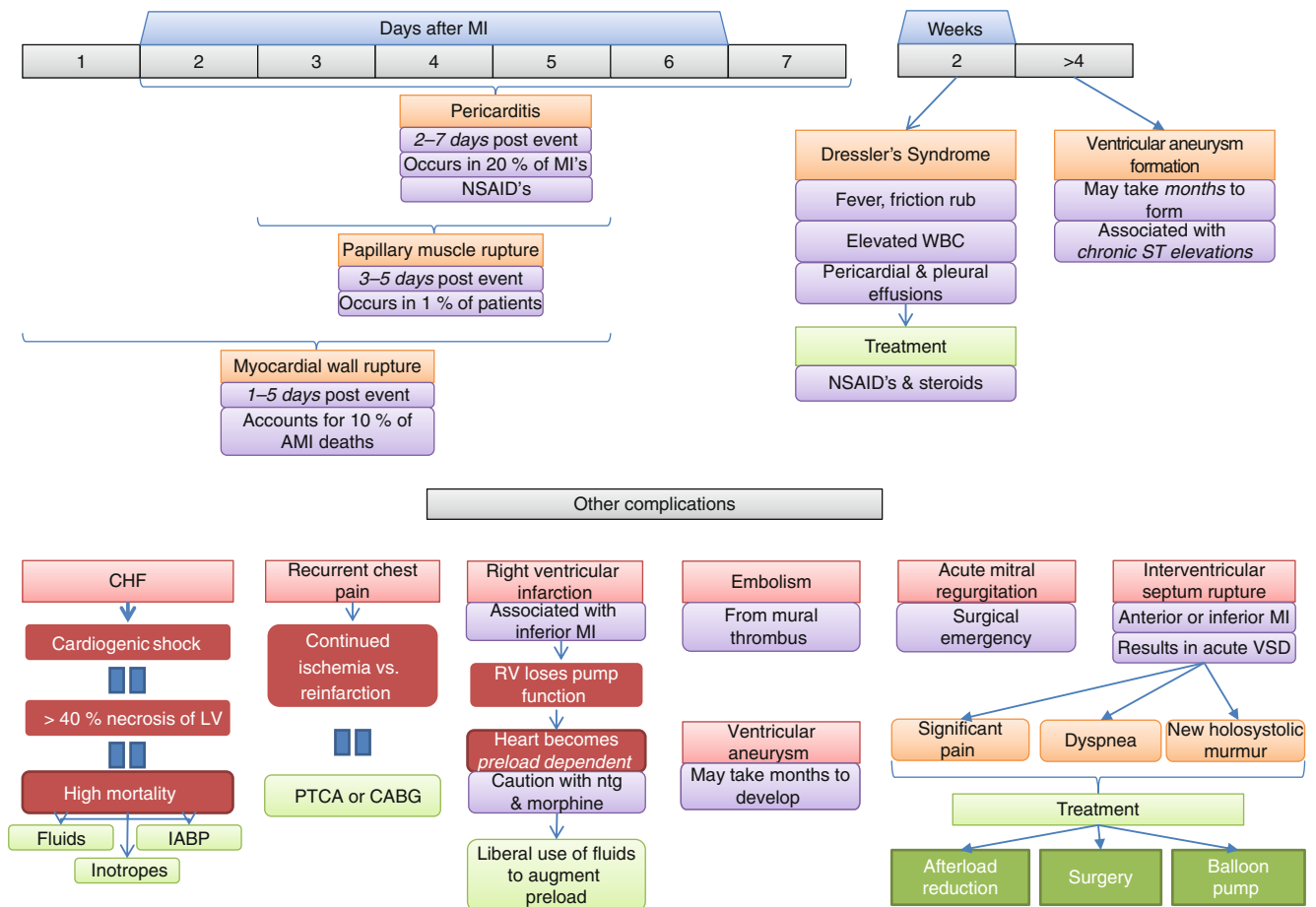
AIVR: EKG Changes



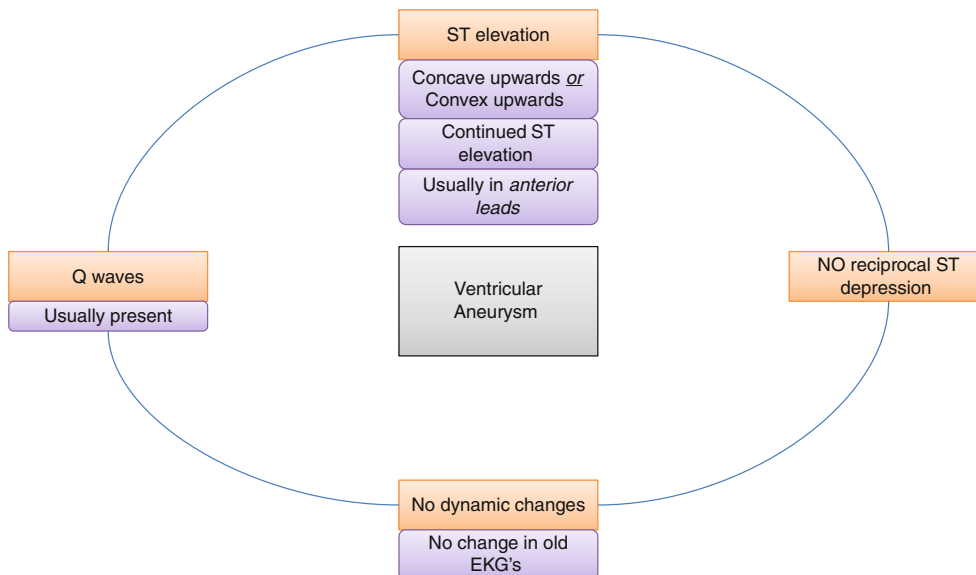
AIVR Treatment



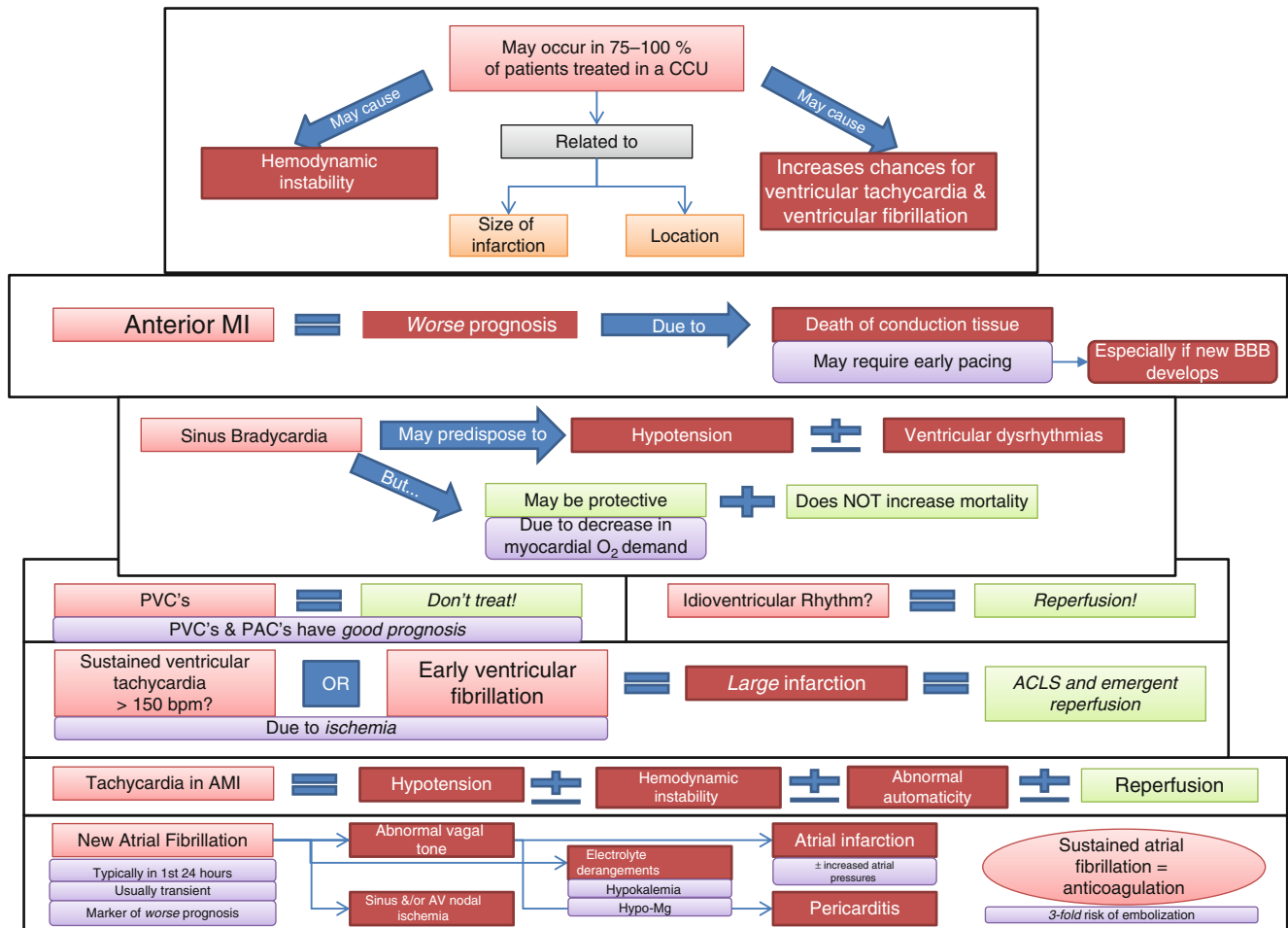
Complications in AMI



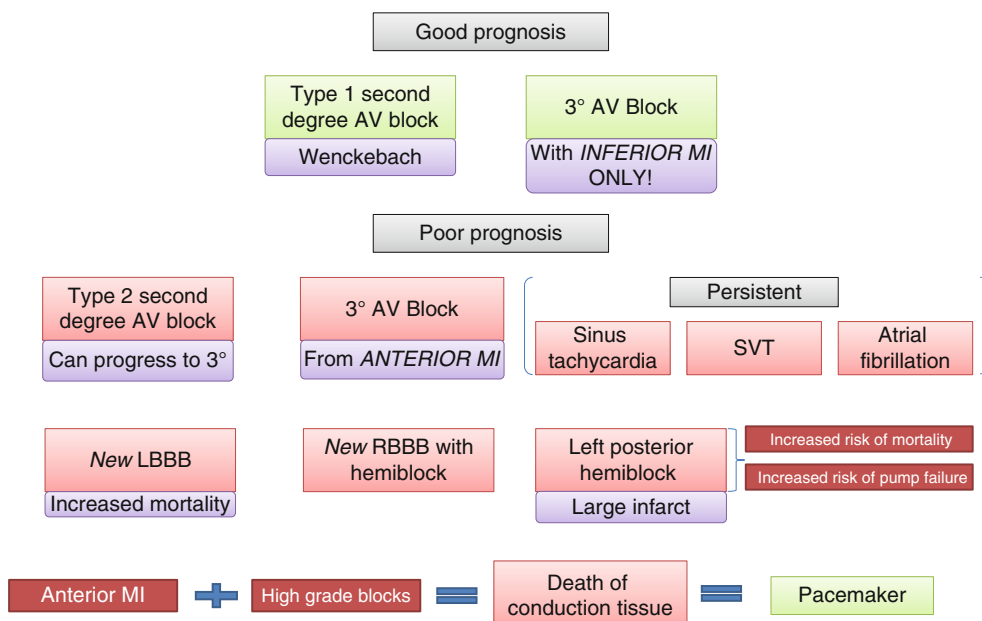
What Factors Predict Ventricular Aneurysm on EKG?



Rhythm Abnormalities in AMI

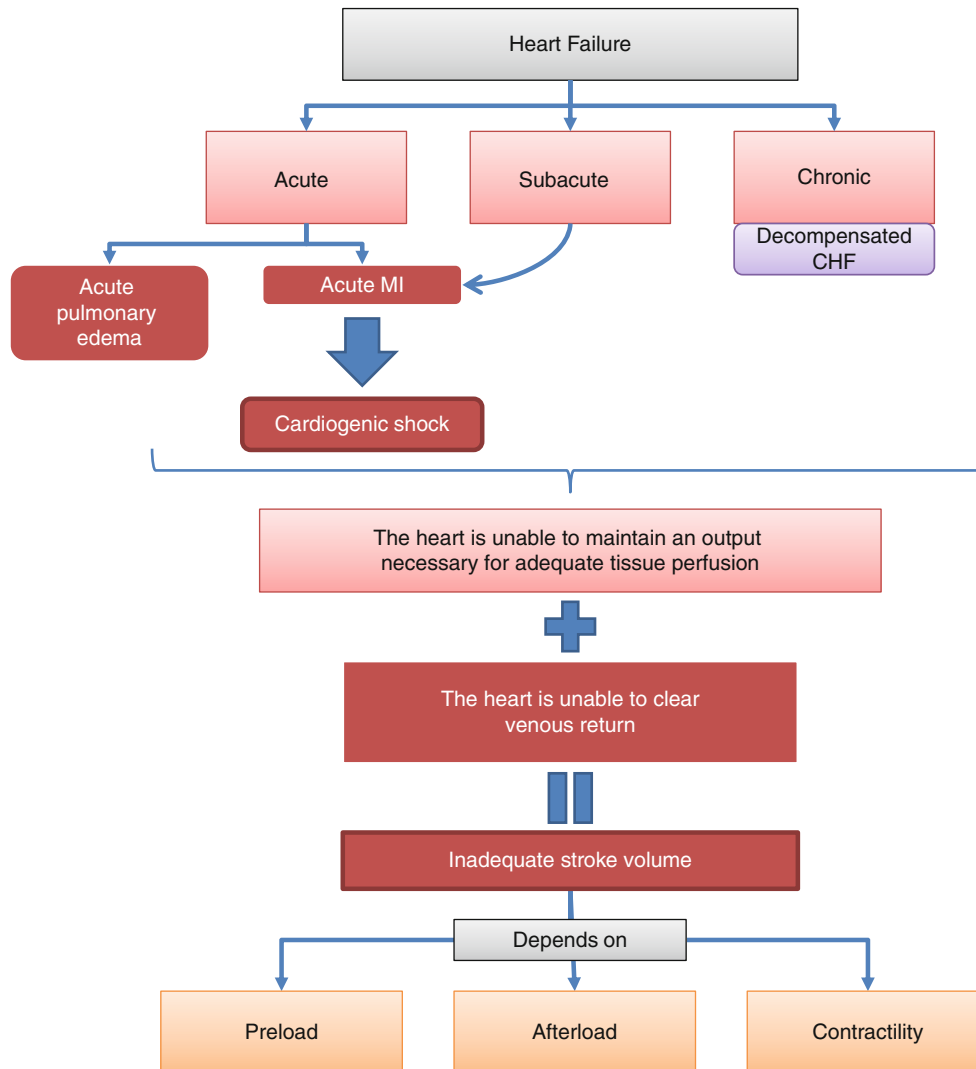


Conduction Disturbances in AMI

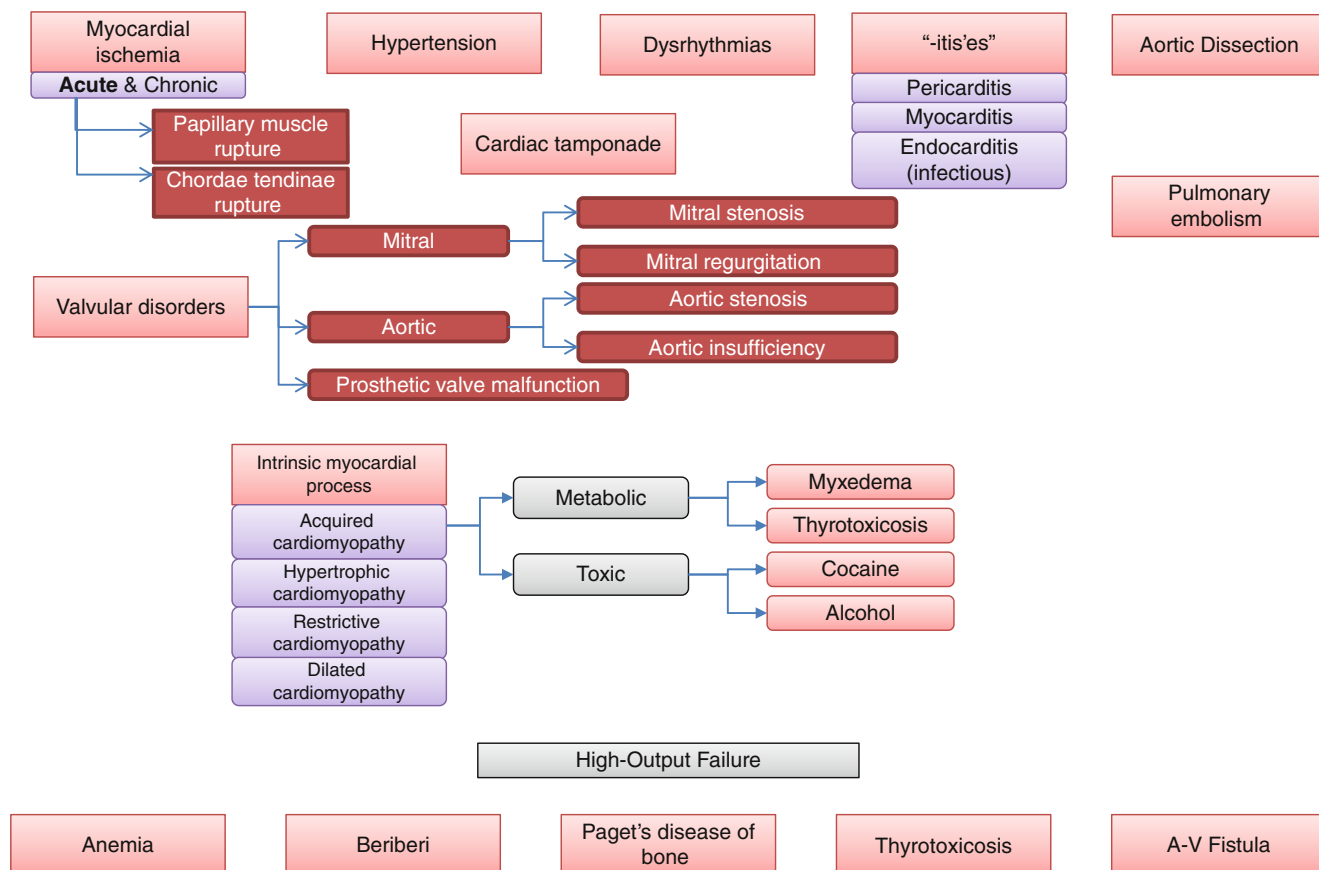


Congestive Heart Failure

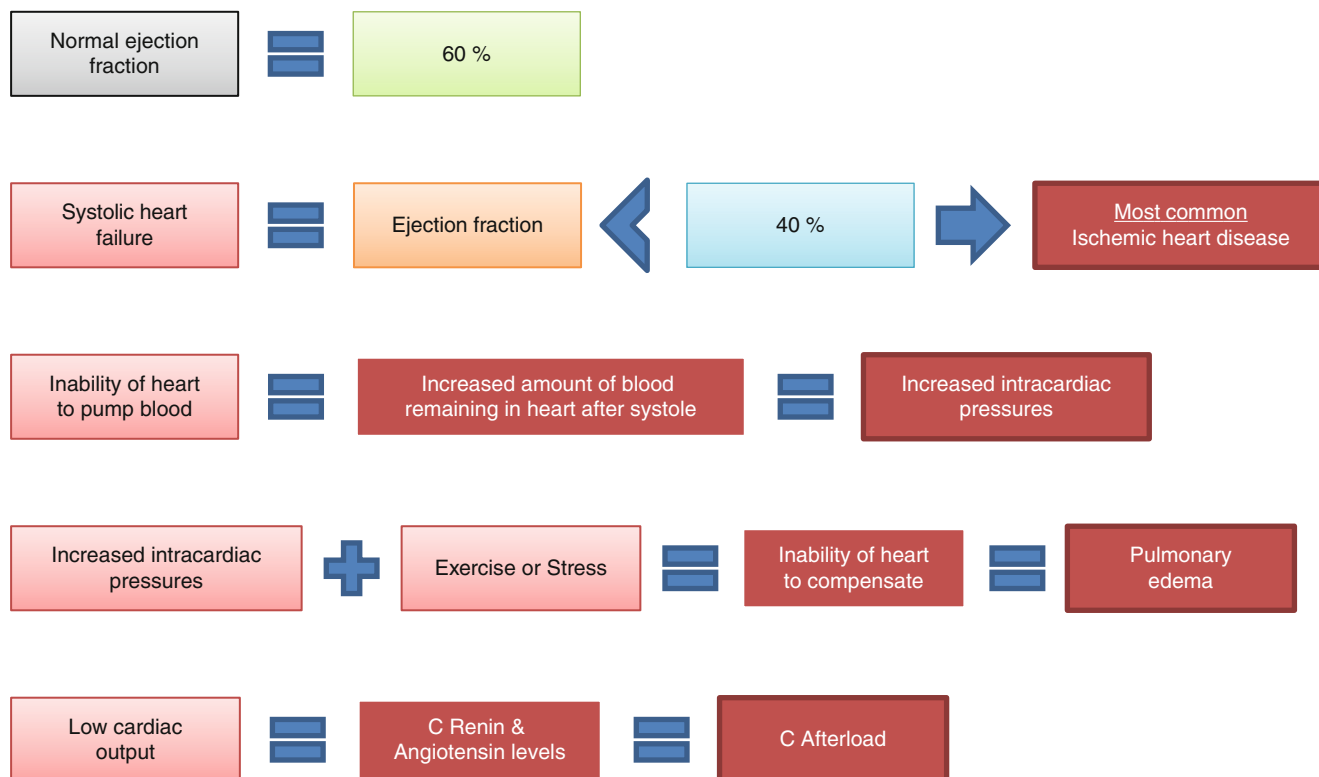
Heart Failure Pathophysiology



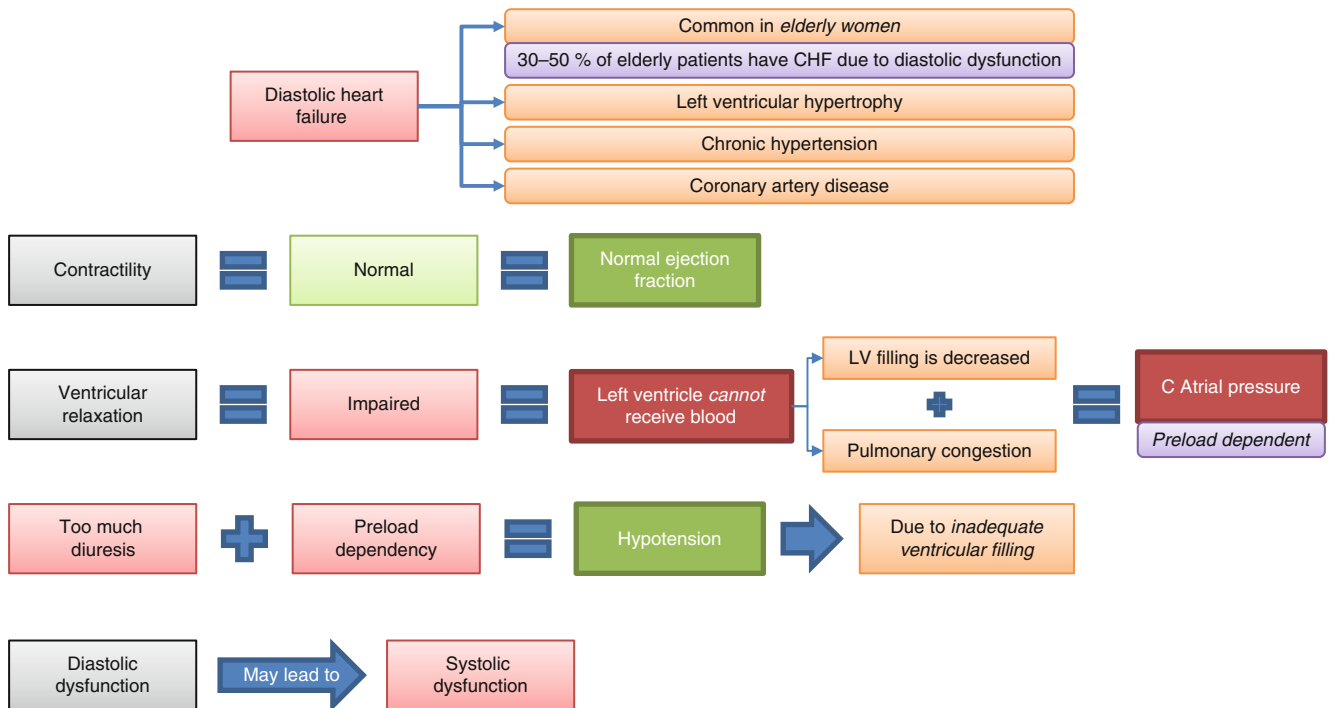
Causes of Heart Failure



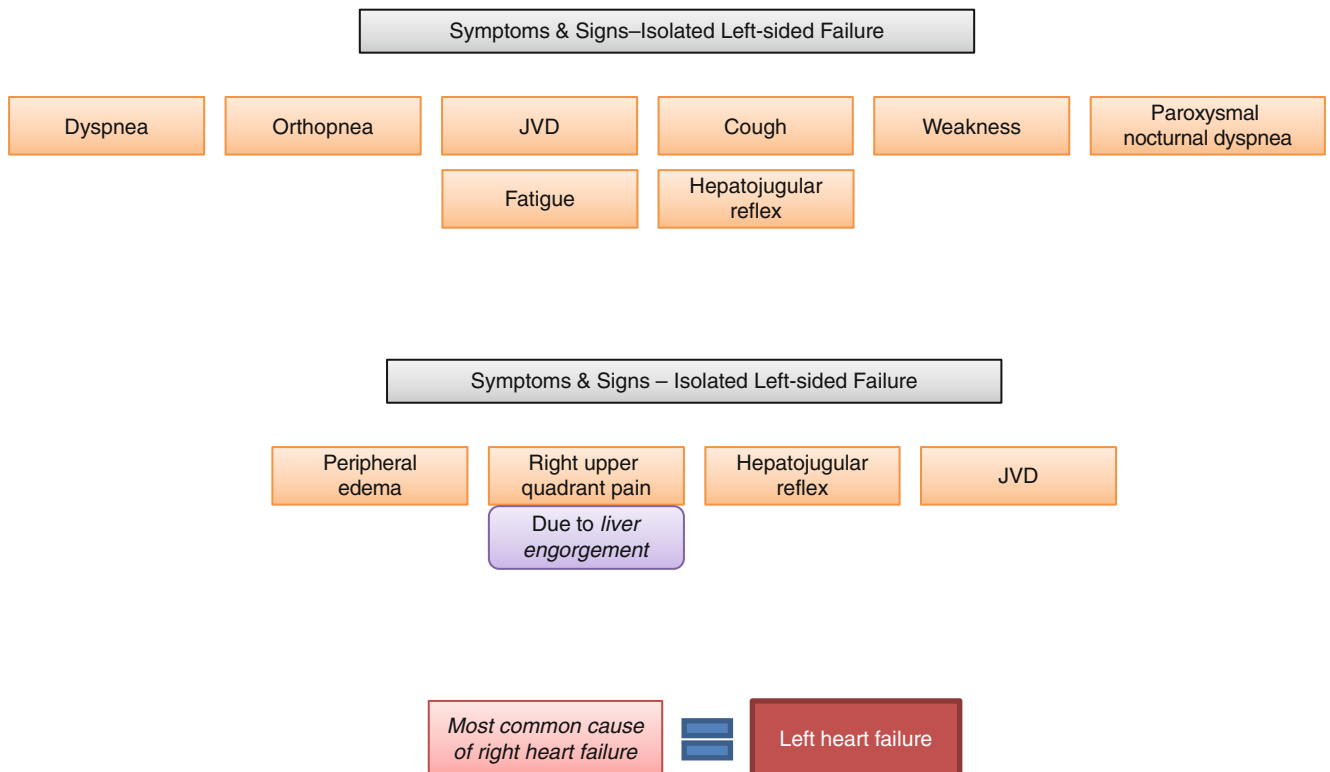
Systolic Heart Failure (Heart Failure Reduced Ejection Fraction)



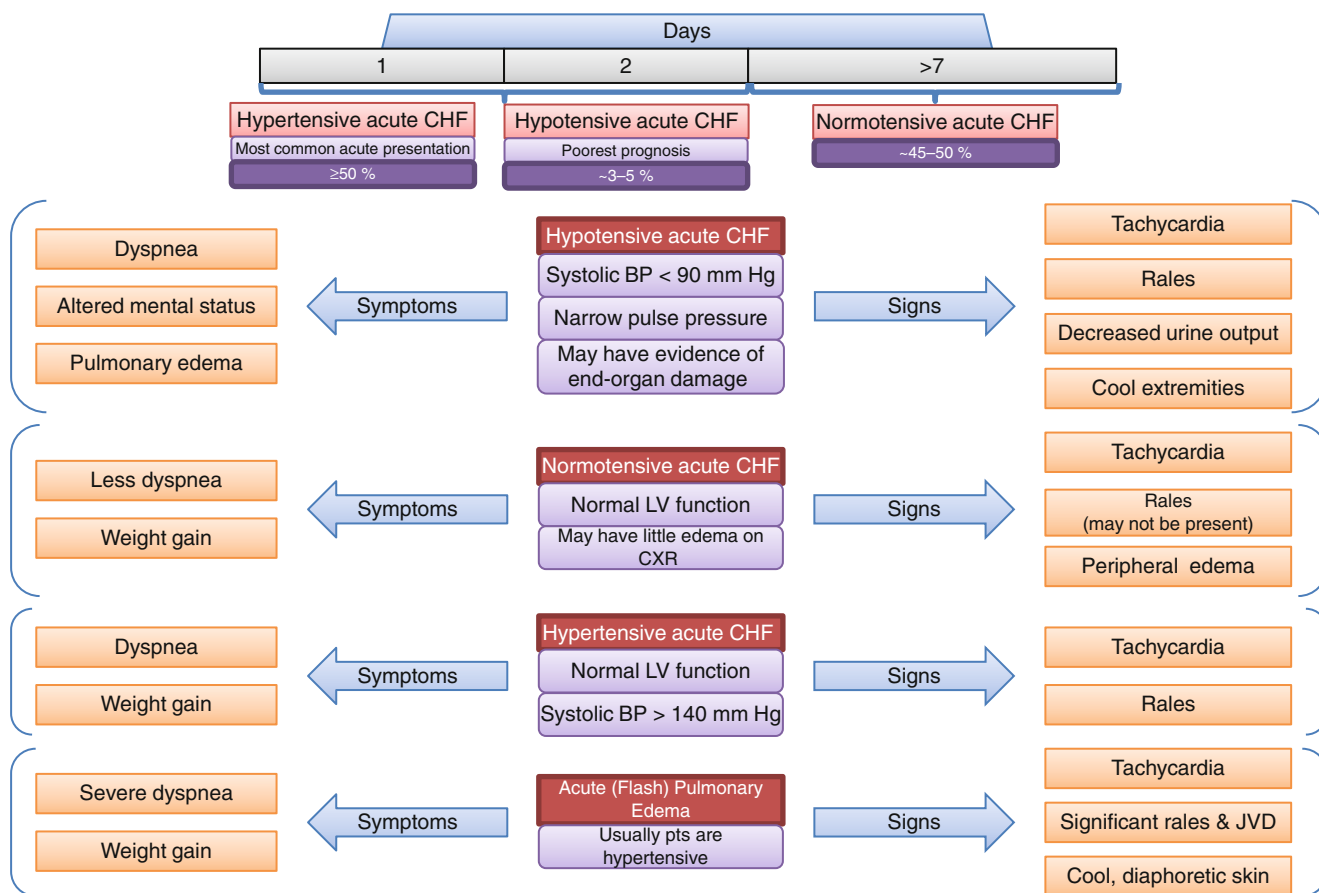
Diastolic Heart Failure (Heart Failure Preserved Ejection Fraction)



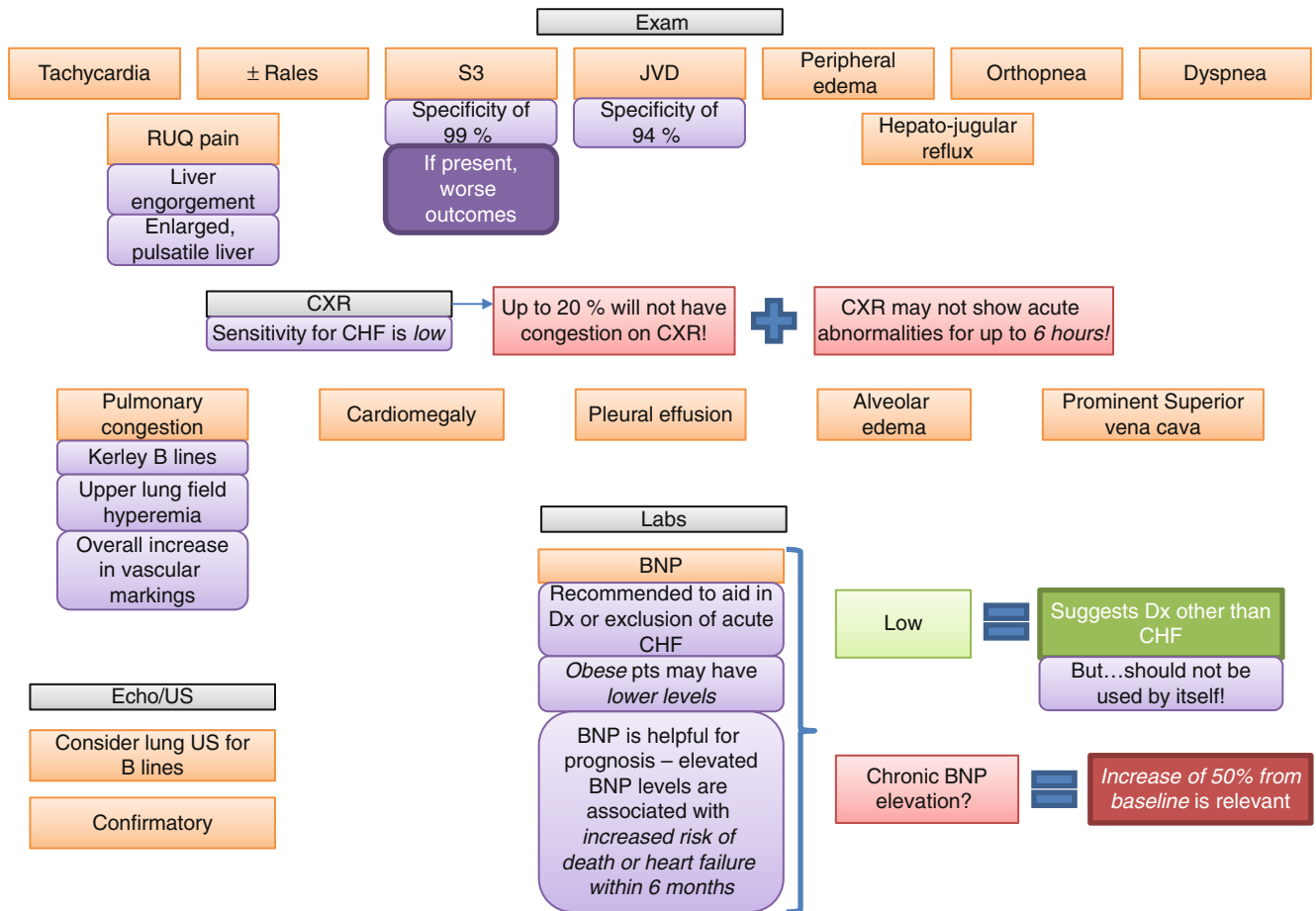
Left Versus Right Heart Failure

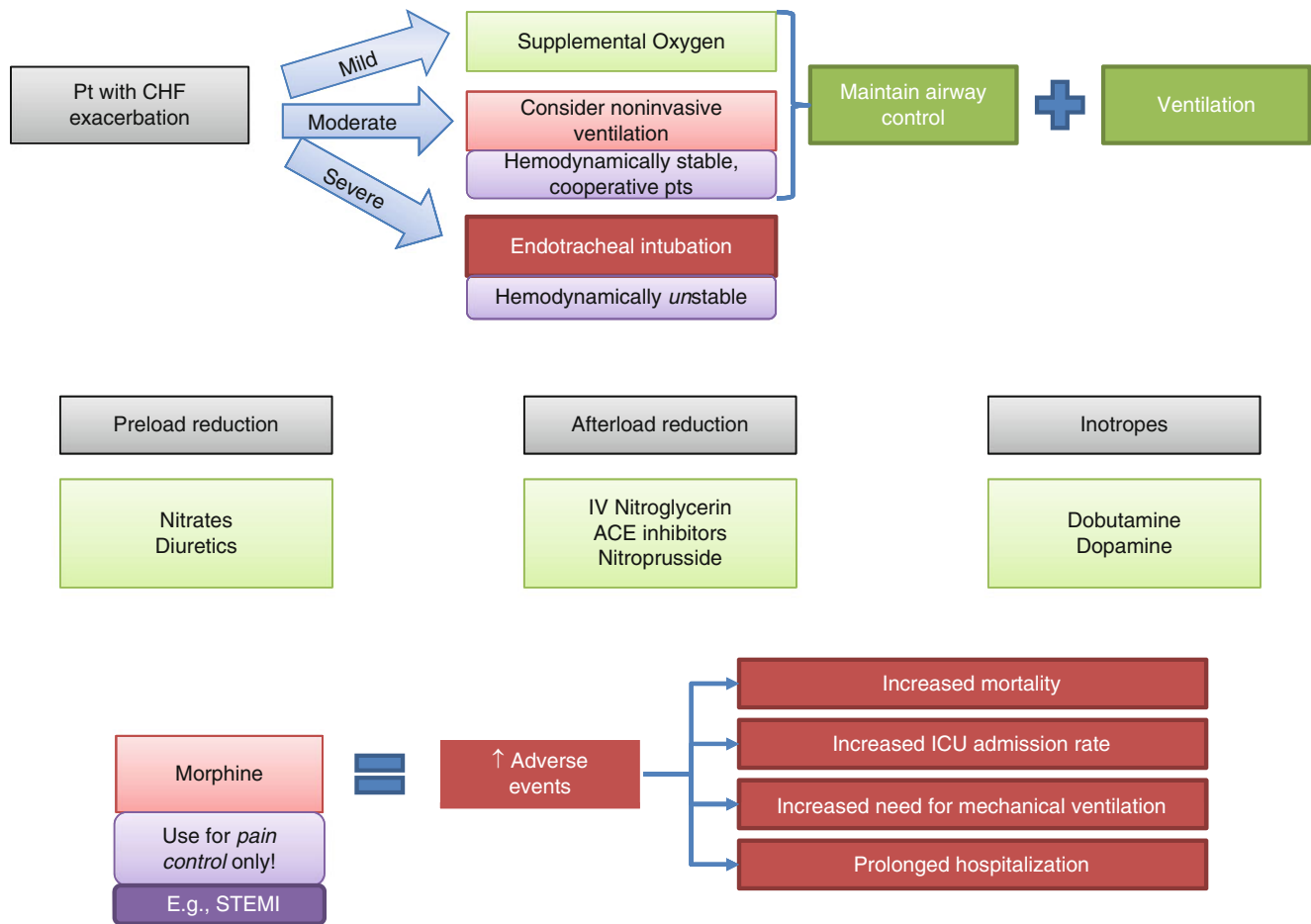


Heart Failure Clinical Features and Presentation

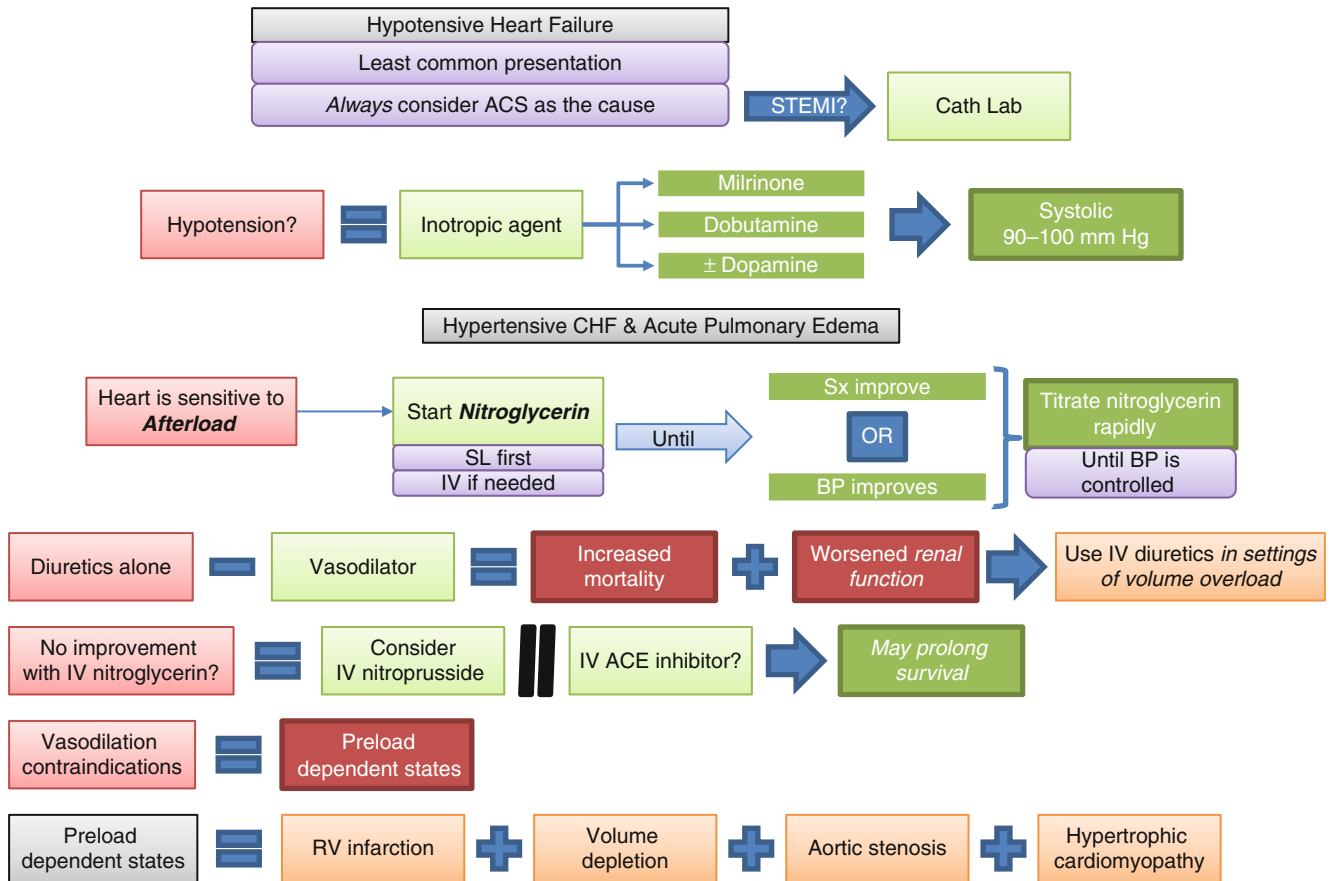


CHF Diagnosis

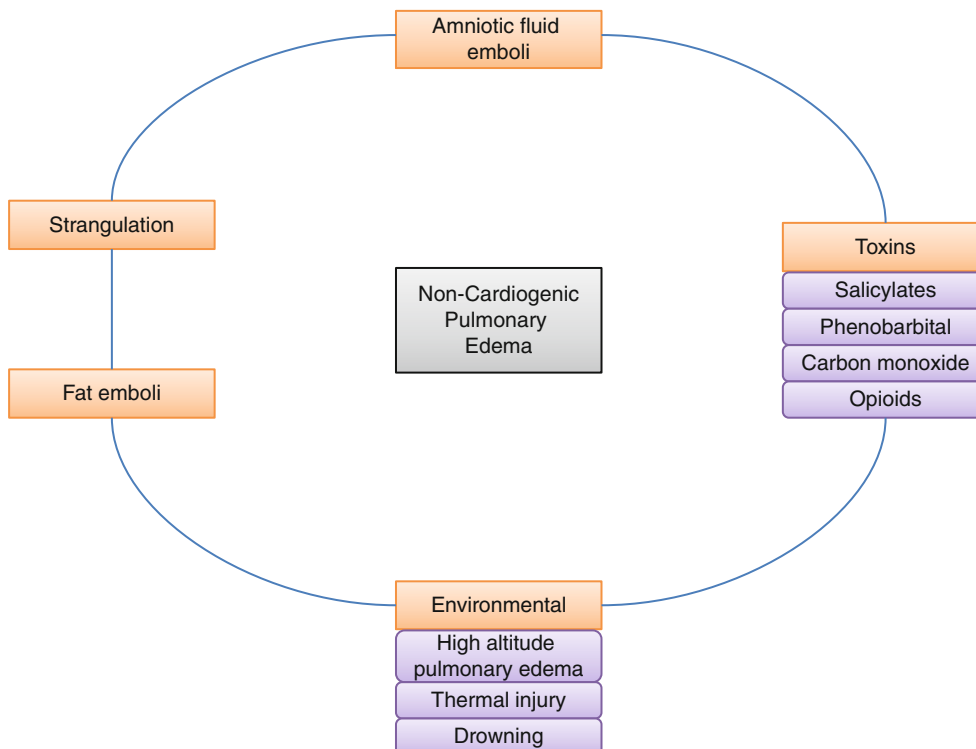


CHF Treatment: General

CHF Treatment: Specific

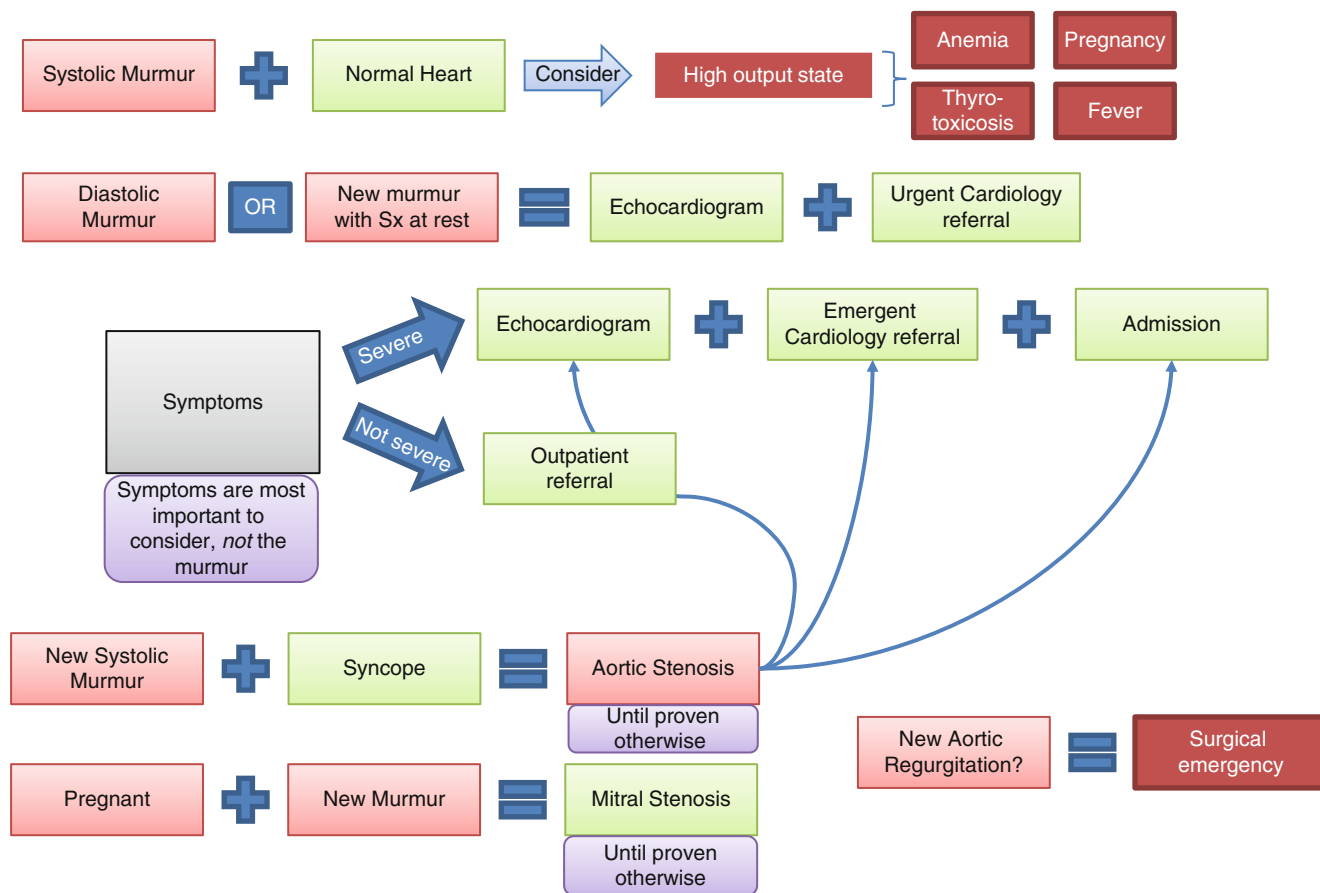


Non-cardiogenic Pulmonary Edema

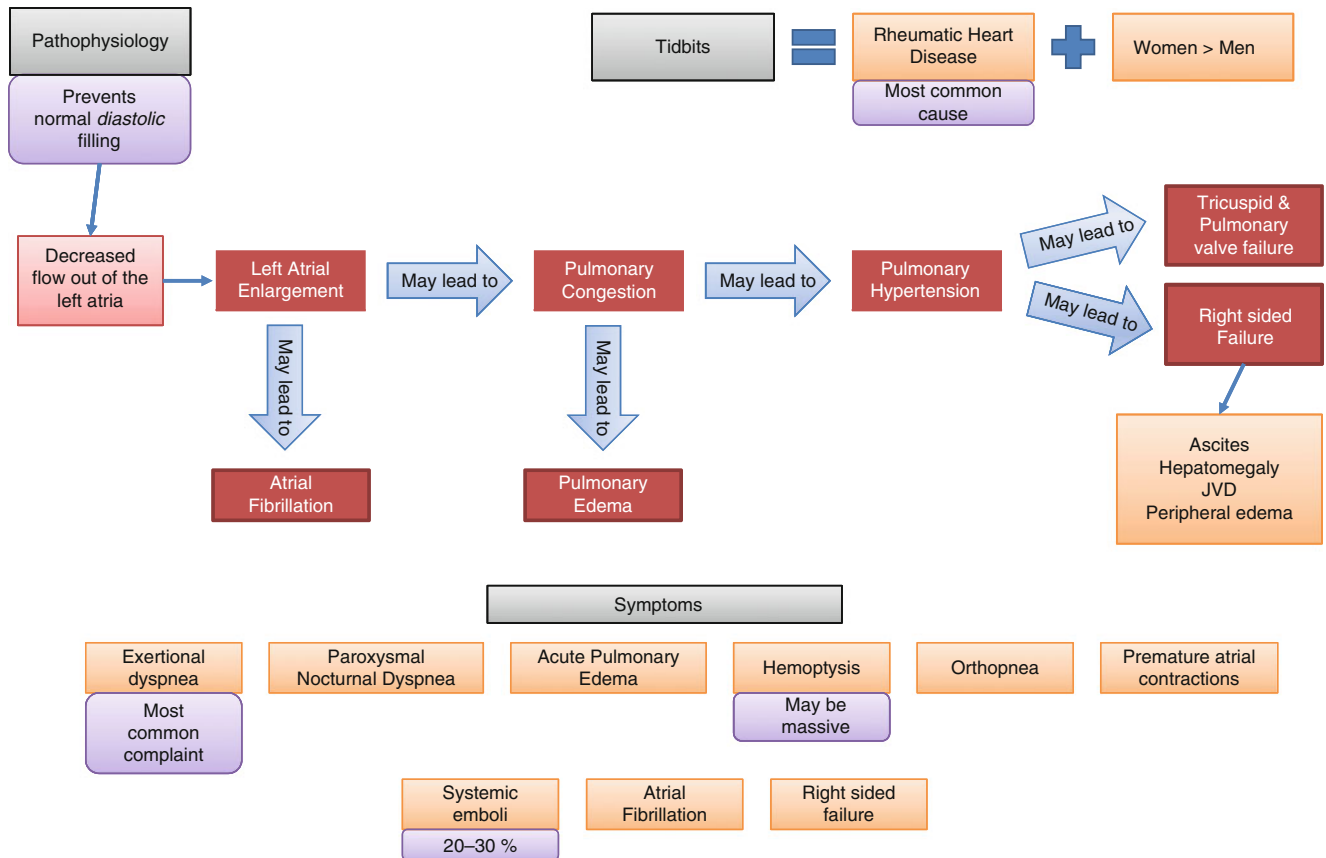


Valvular Emergencies

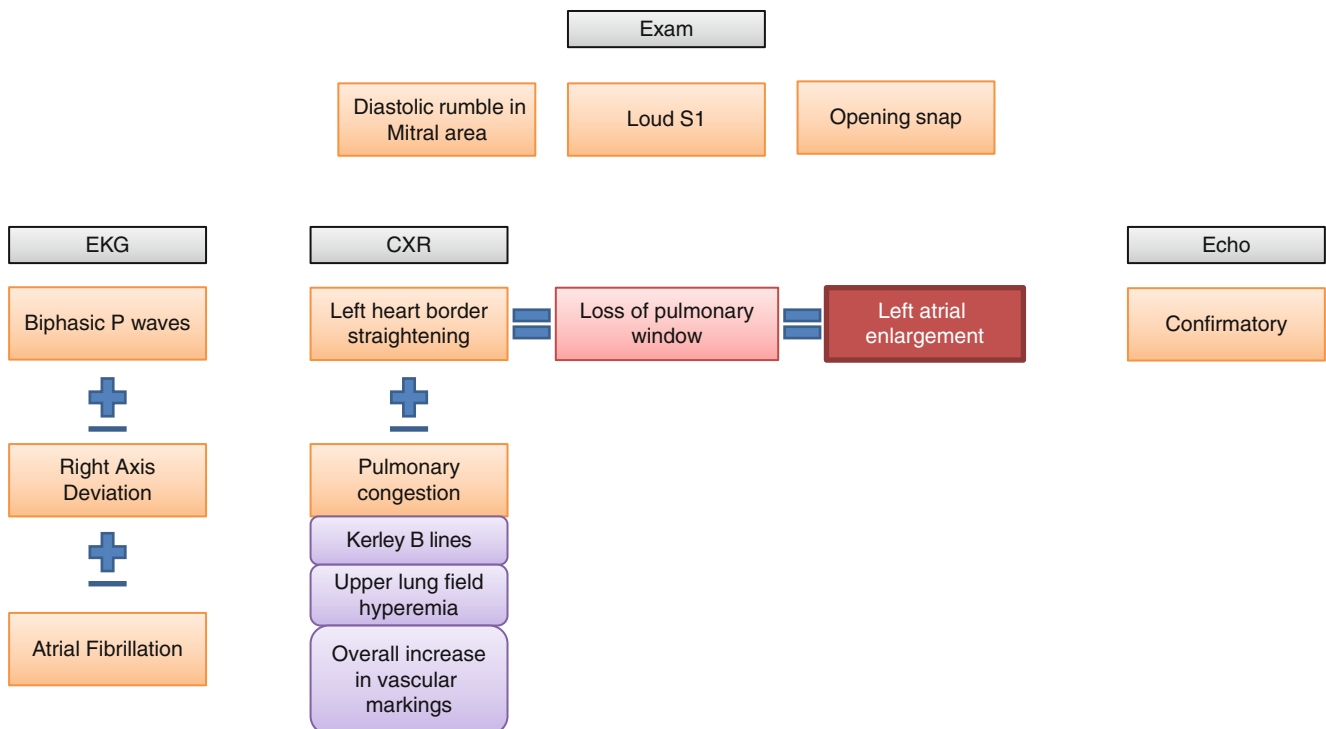
New Murmur



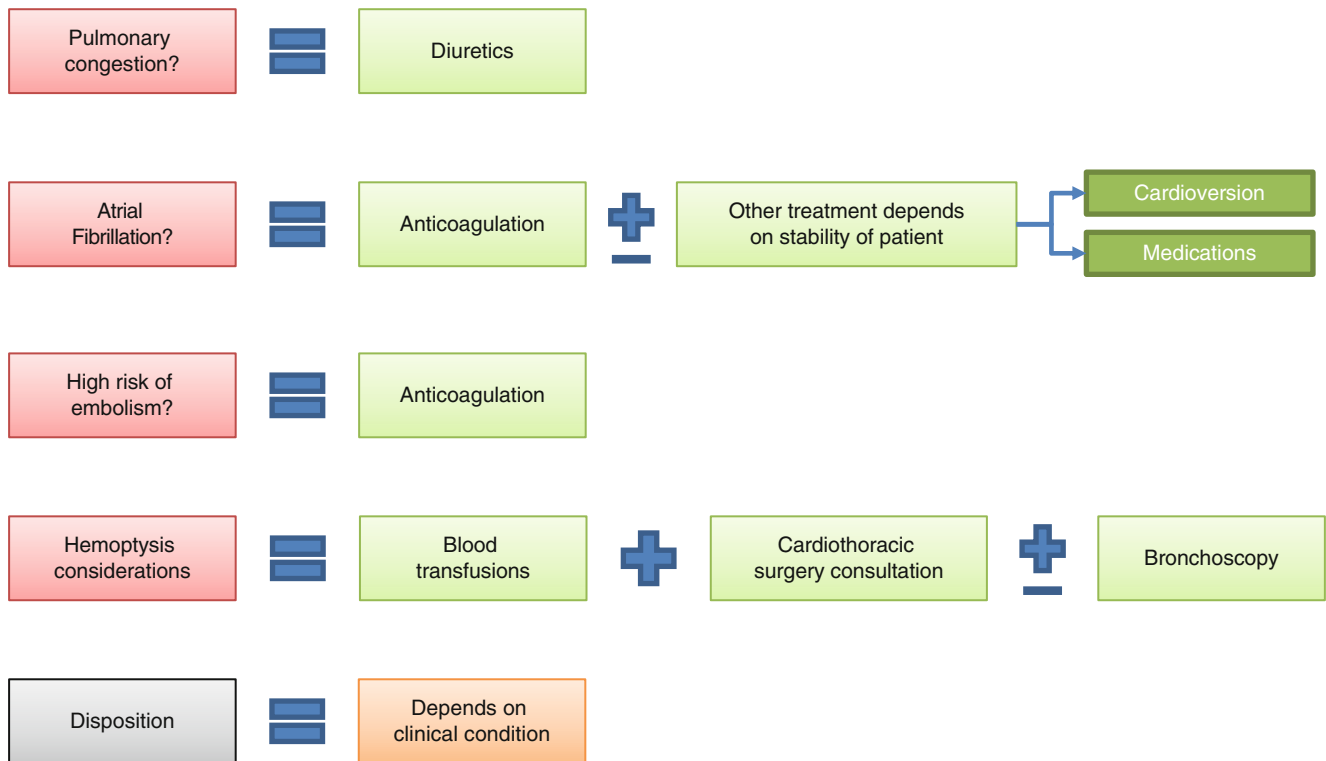
Mitral Stenosis



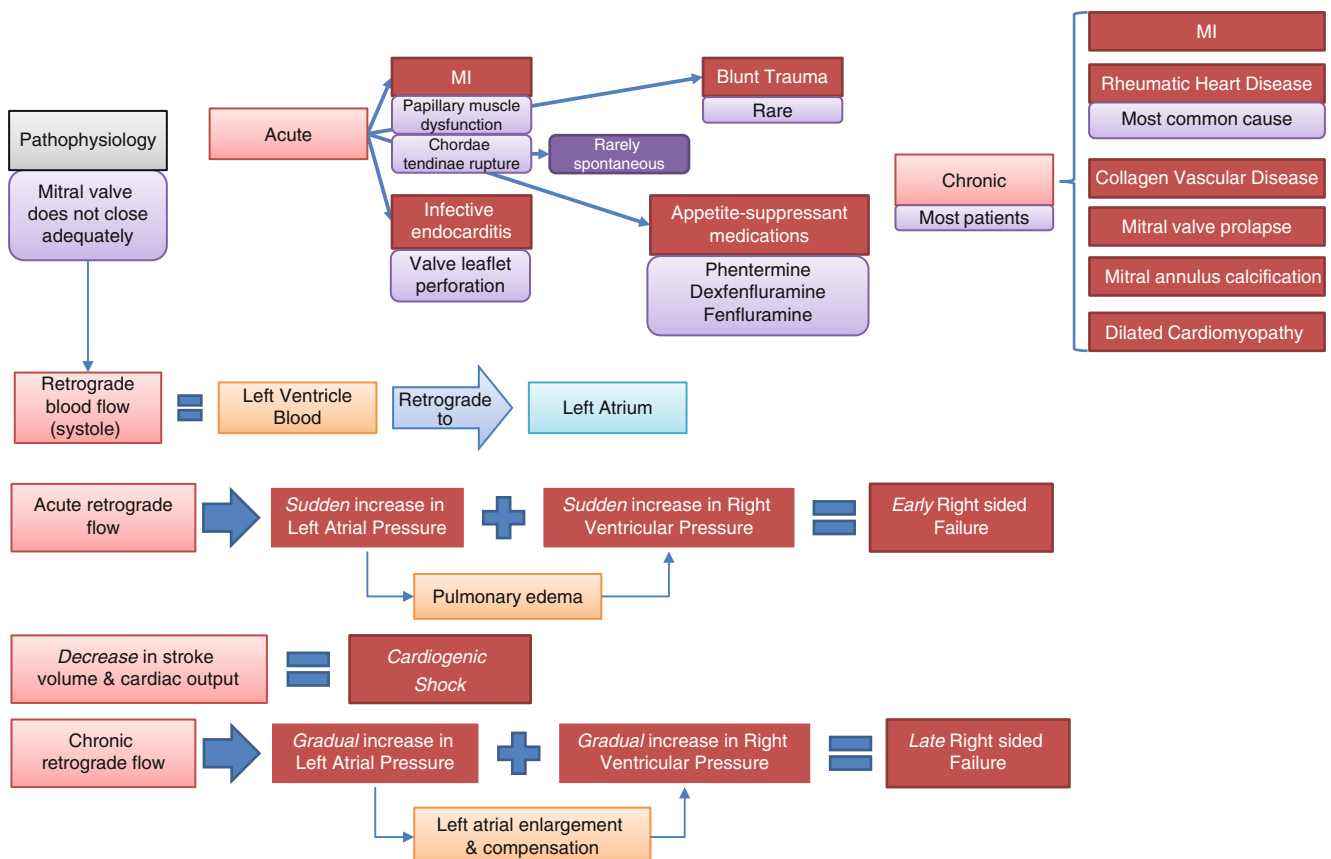
Mitral Stenosis Diagnosis



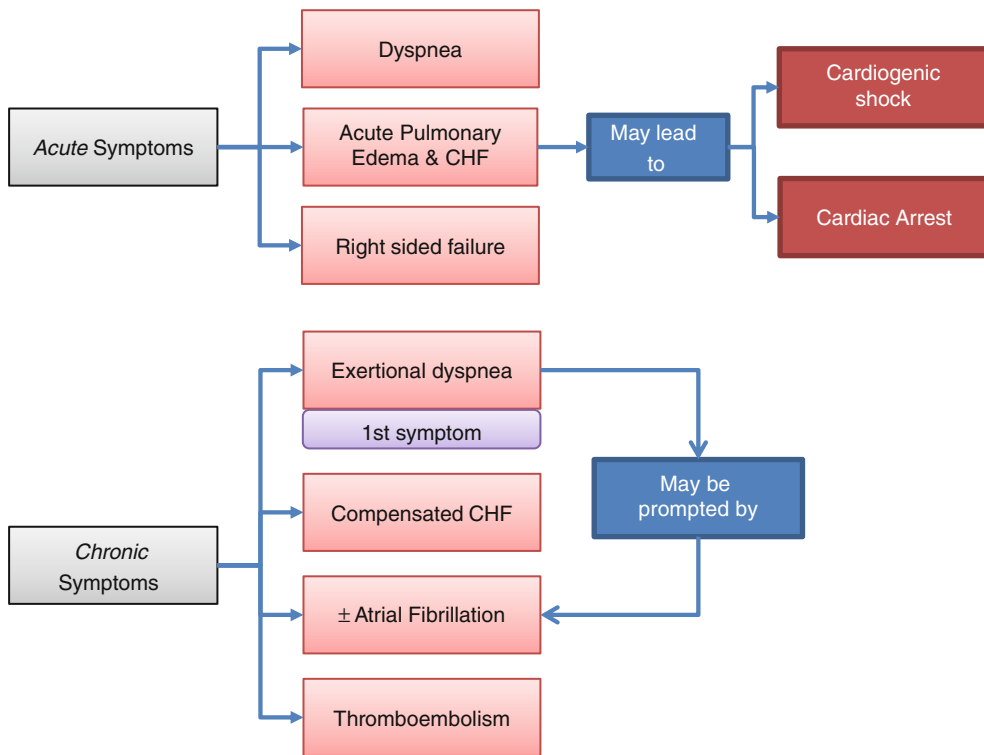
Mitral Stenosis Treatment



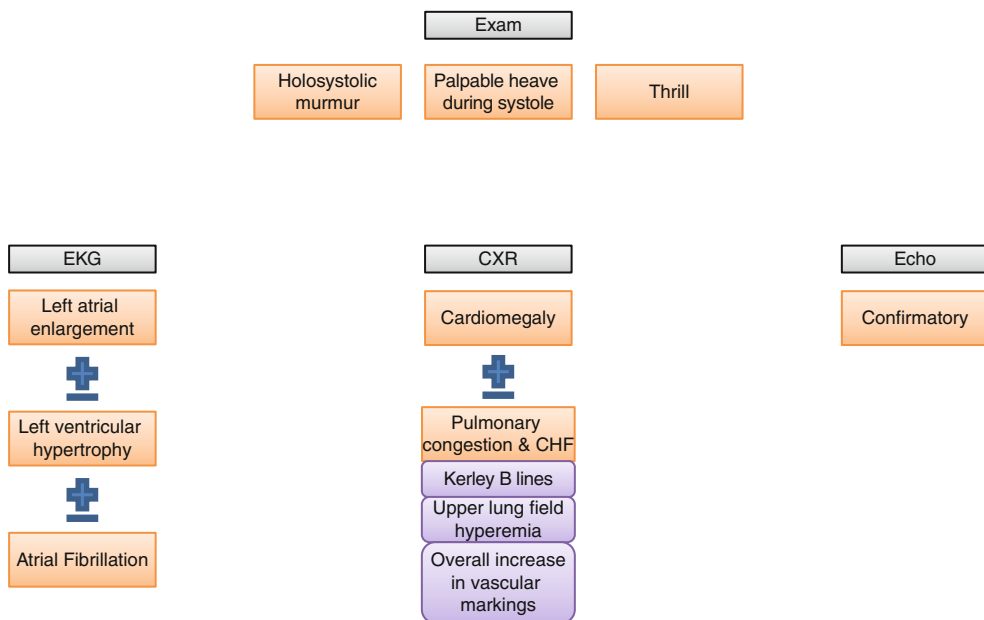
Mitral Regurgitation



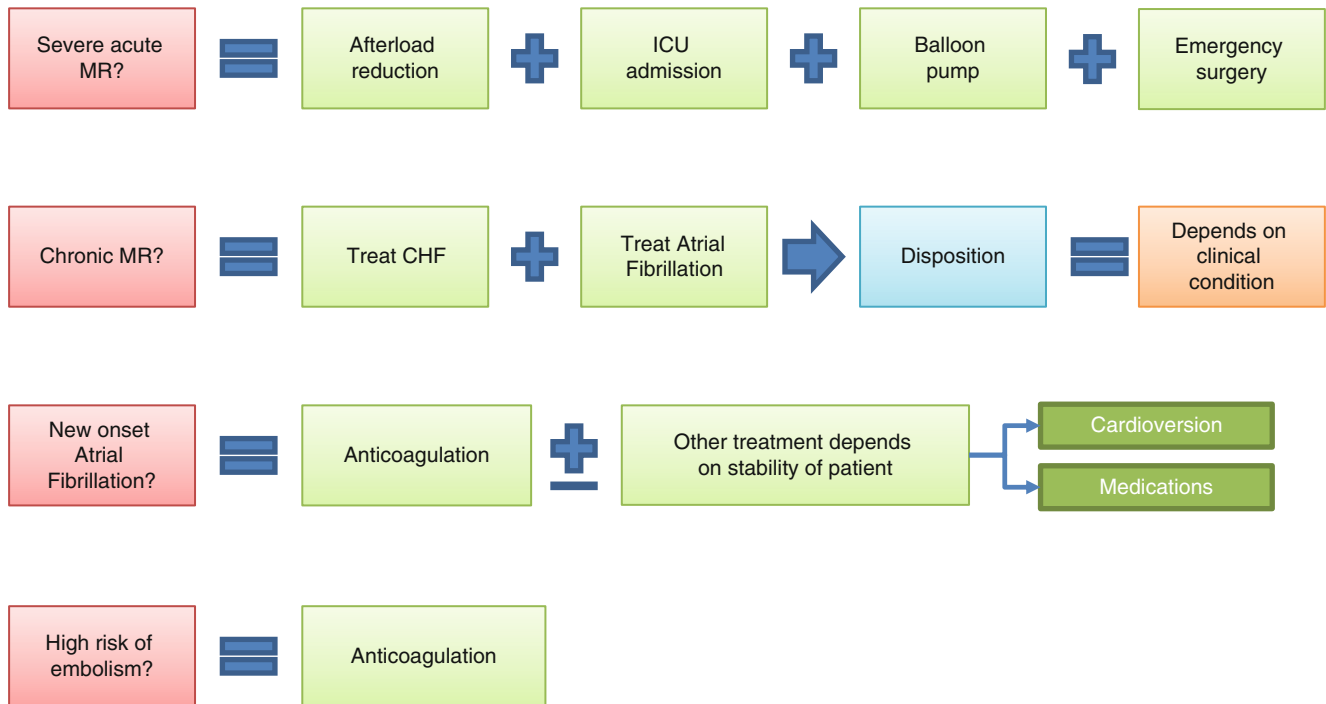
Mitral Regurgitation Symptoms



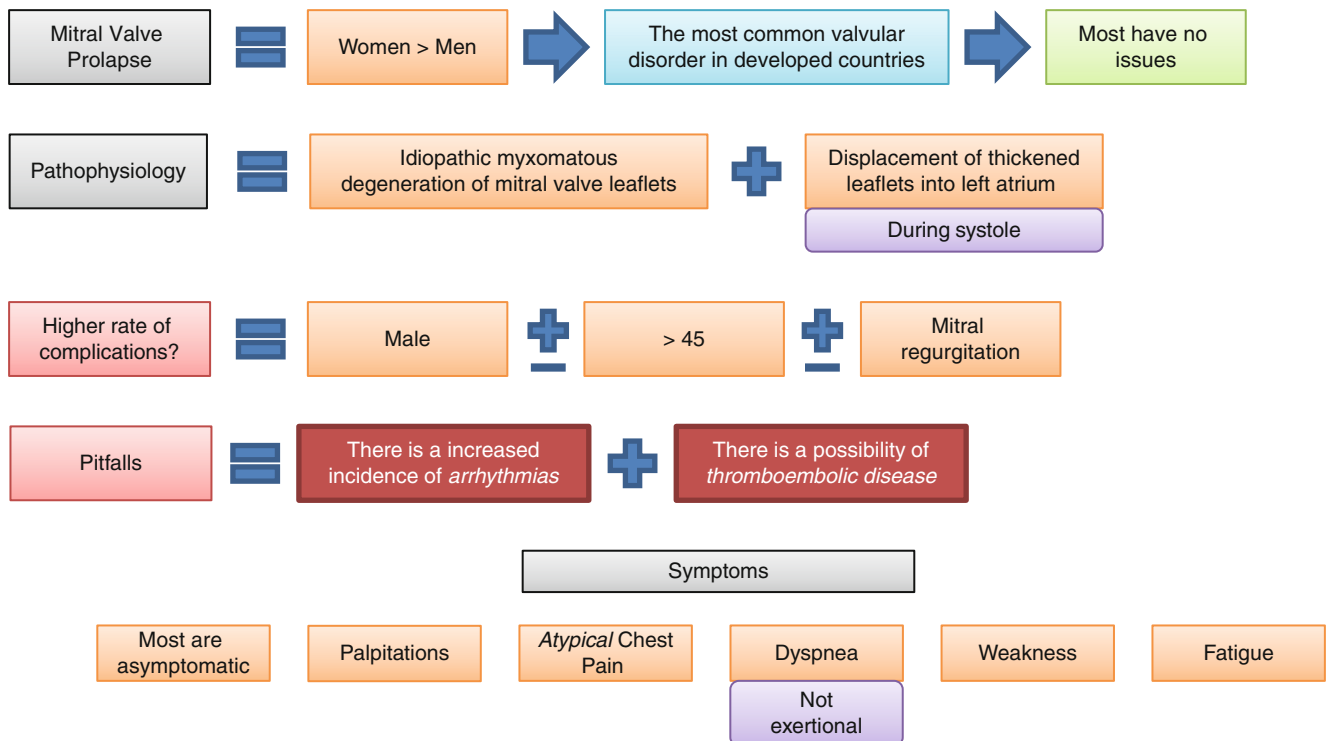
Mitral Regurgitation Diagnosis



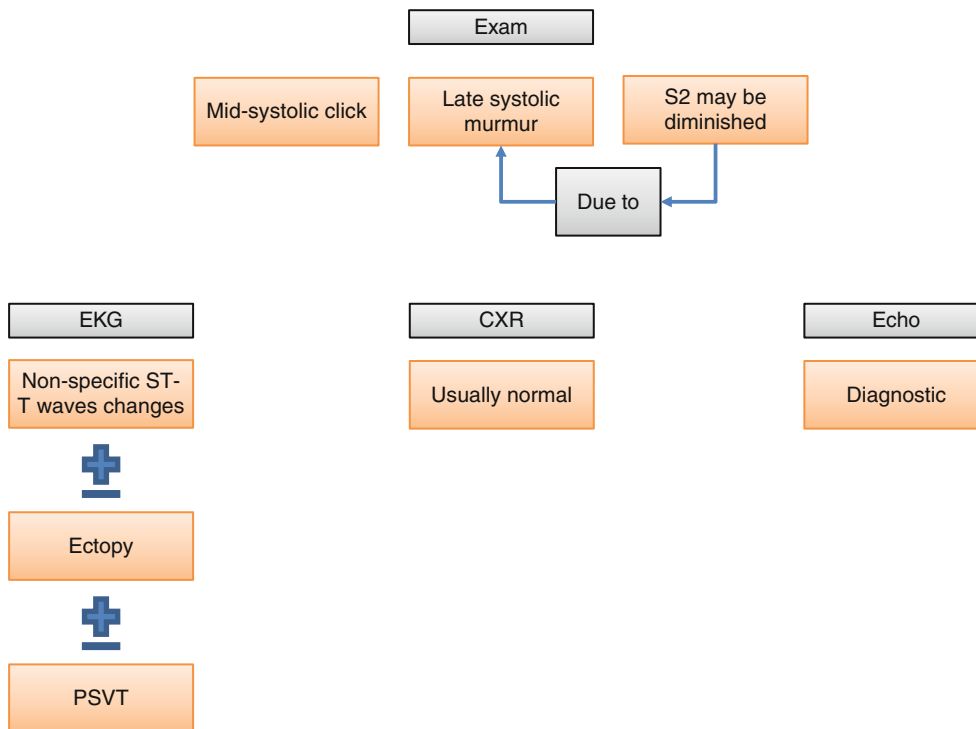
Mitral Regurgitation Treatment



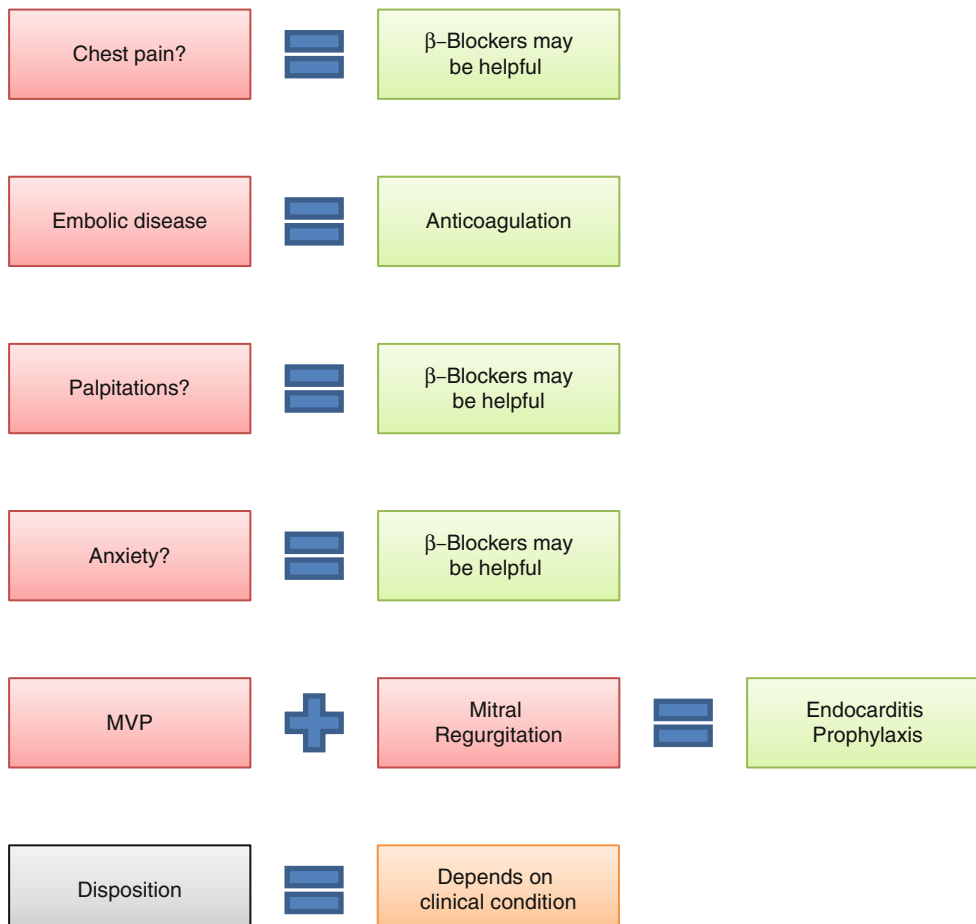
Mitral Valve Prolapse



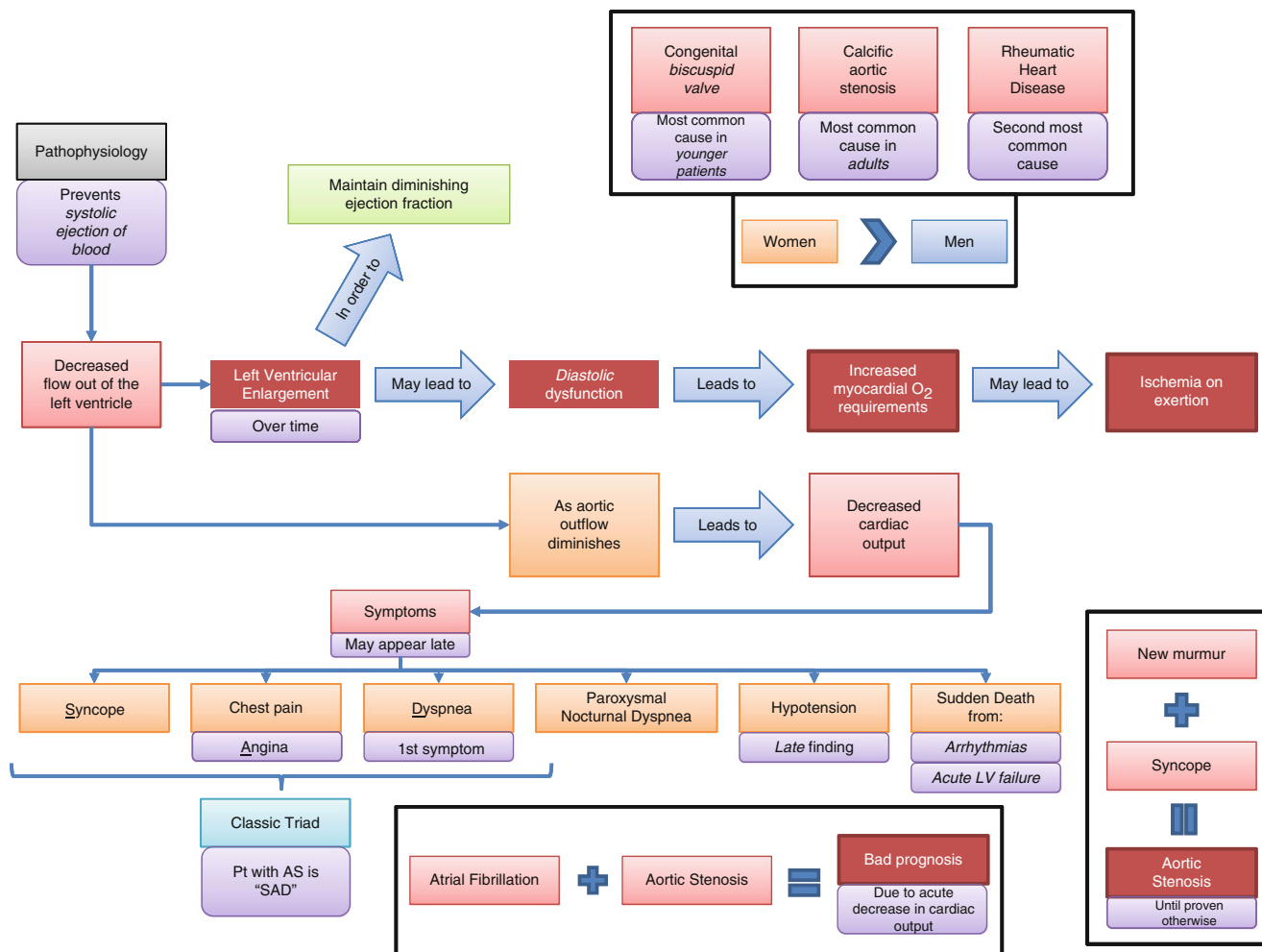
Mitral Valve Prolapse Diagnosis



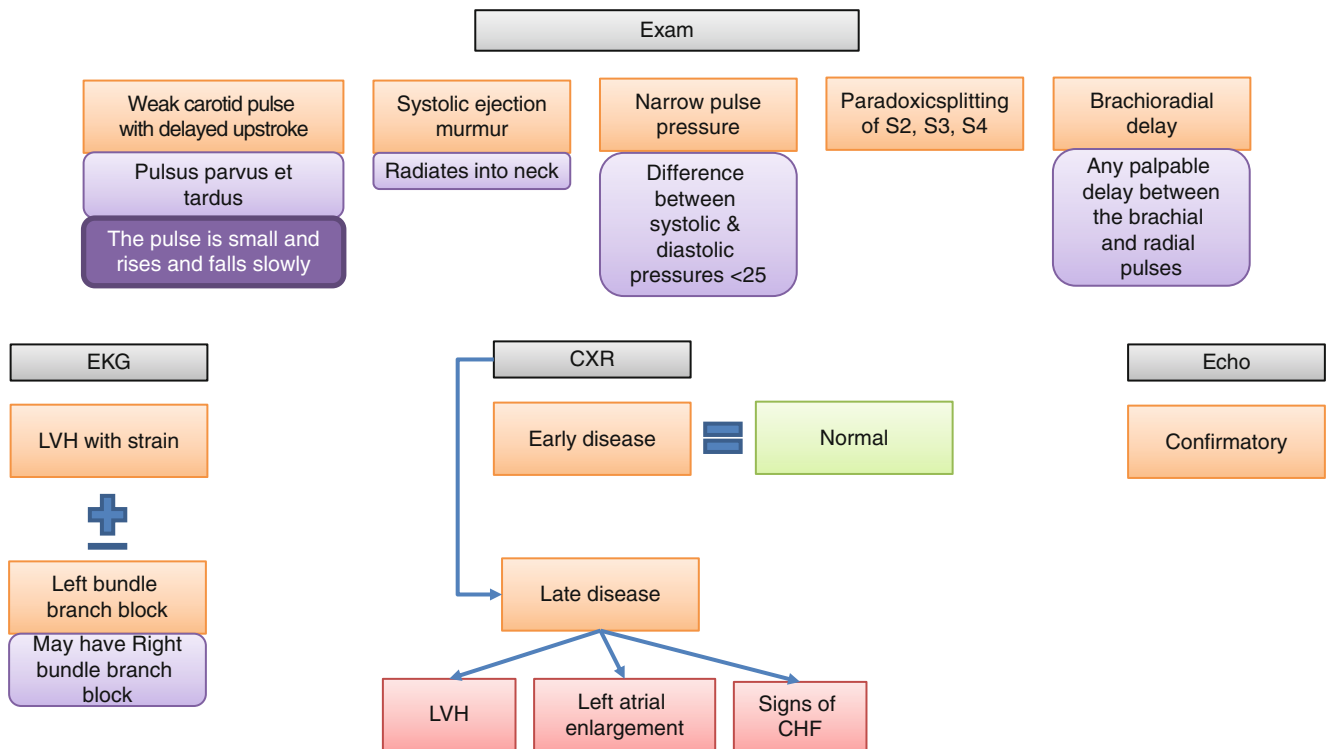
Mitral Valve Prolapse Treatment



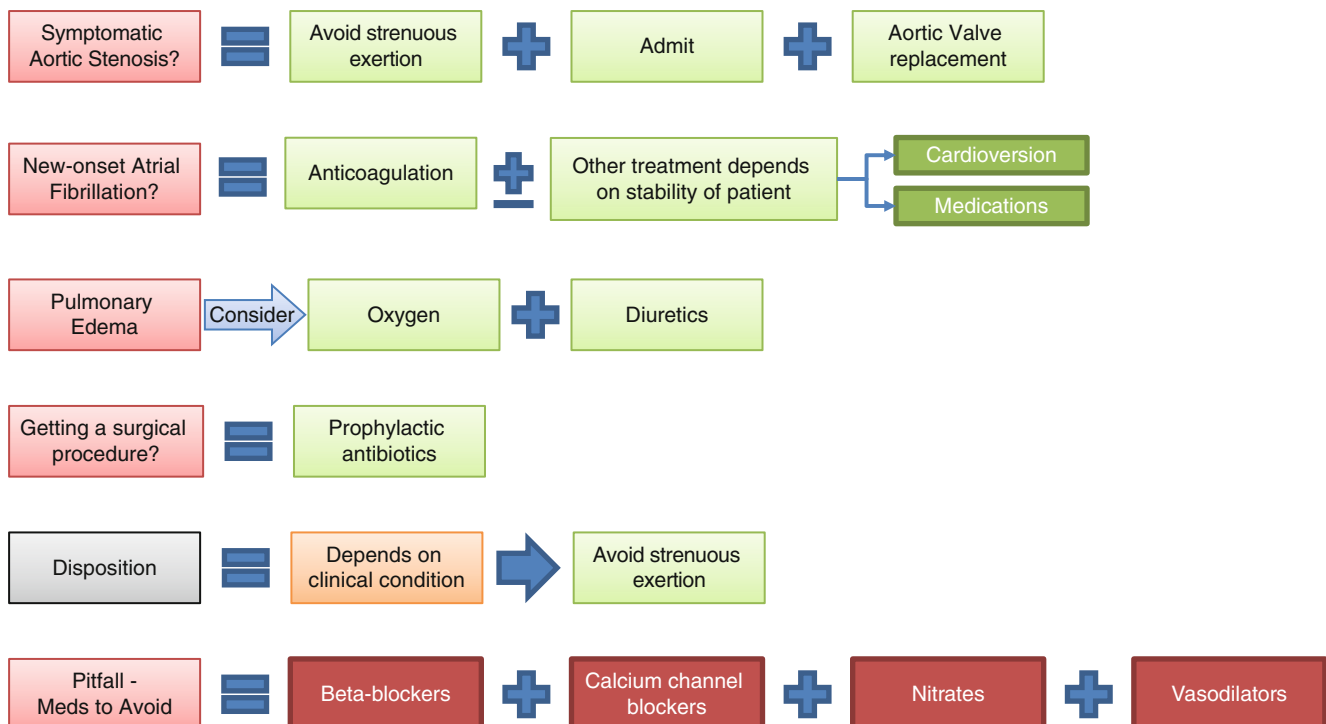
Aortic Stenosis



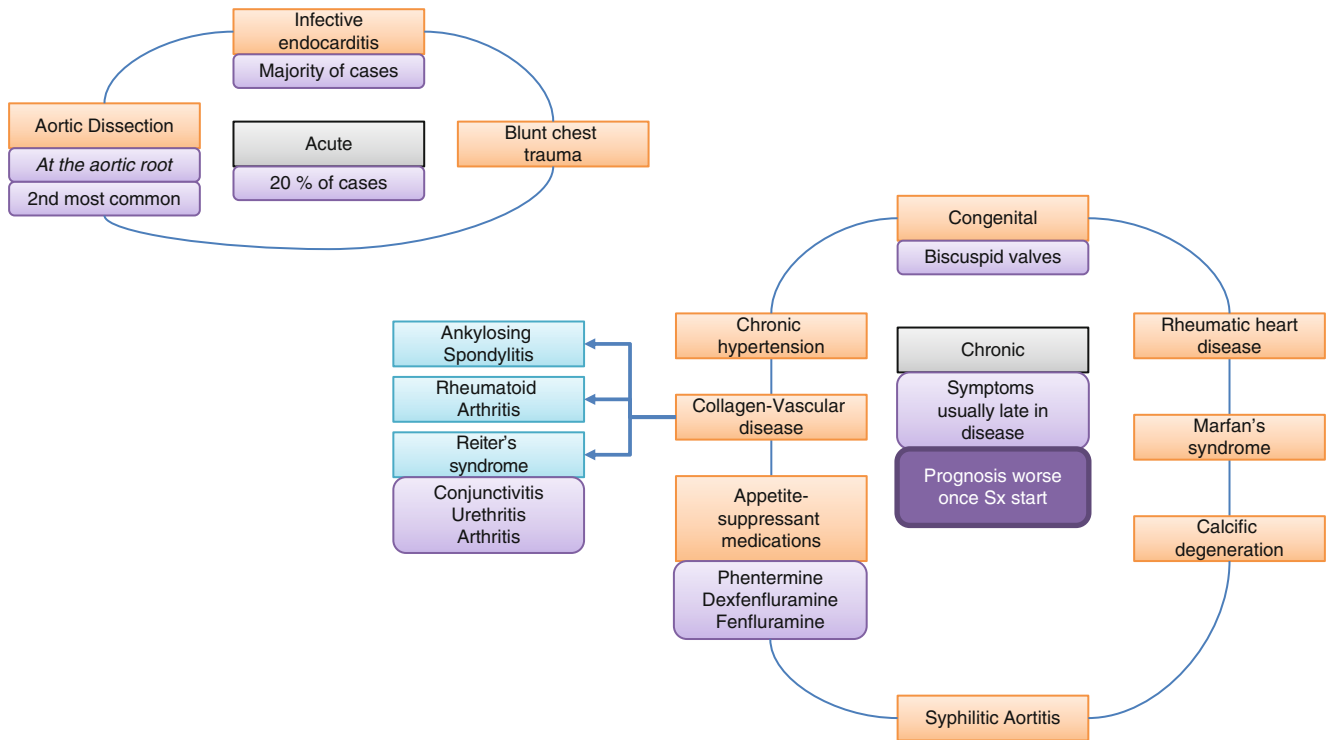
Aortic Stenosis Diagnosis



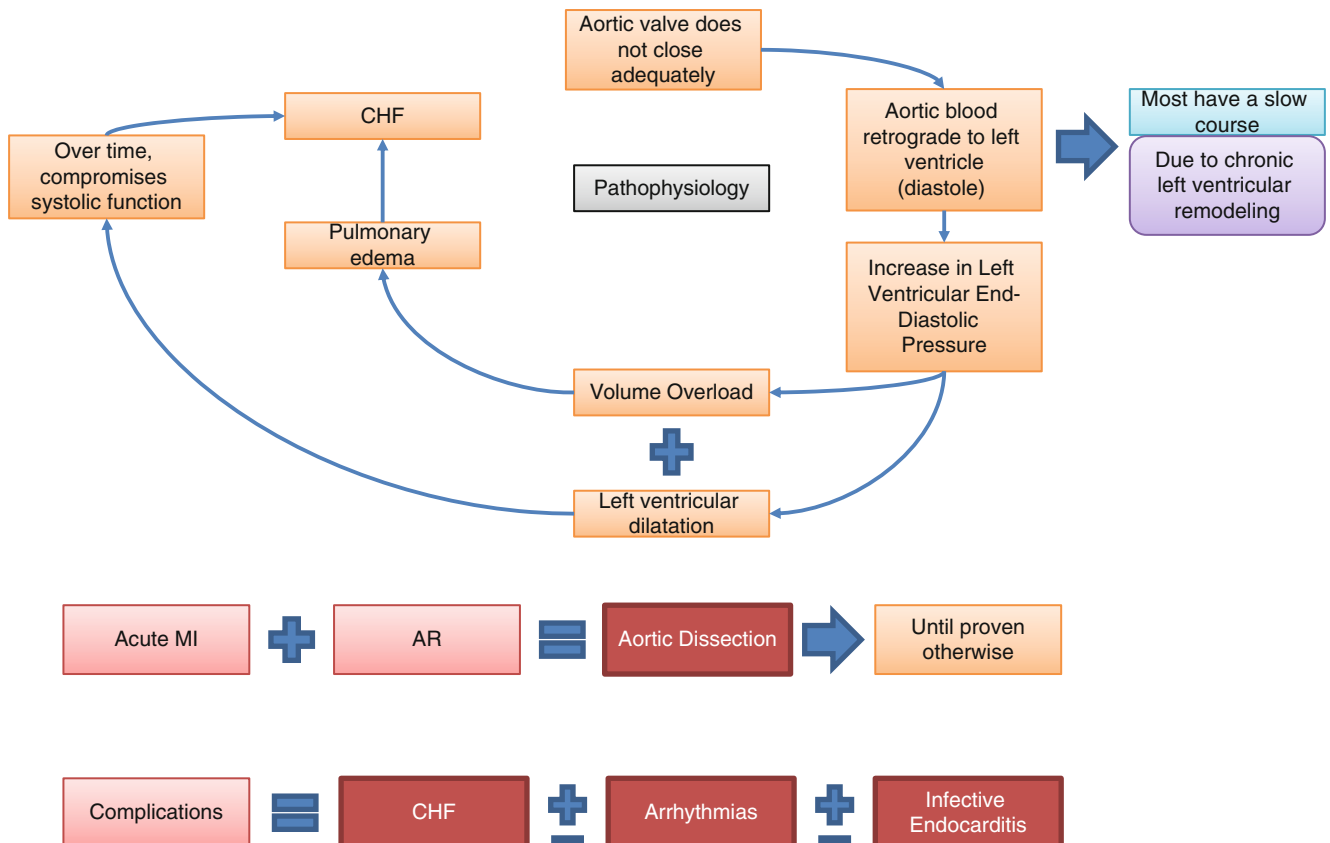
Aortic Stenosis Treatment



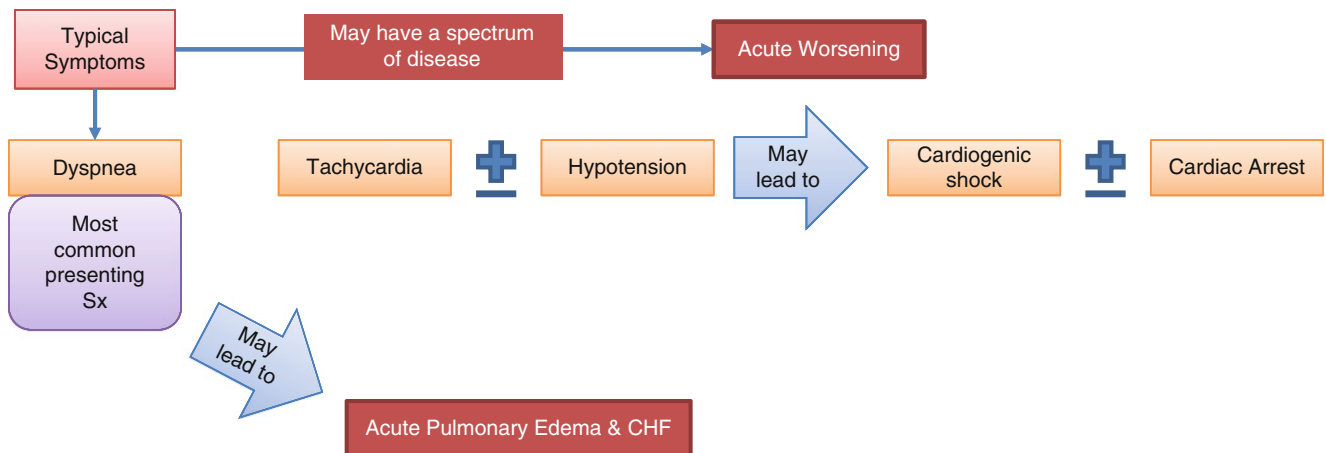
Causes of Aortic Regurgitation



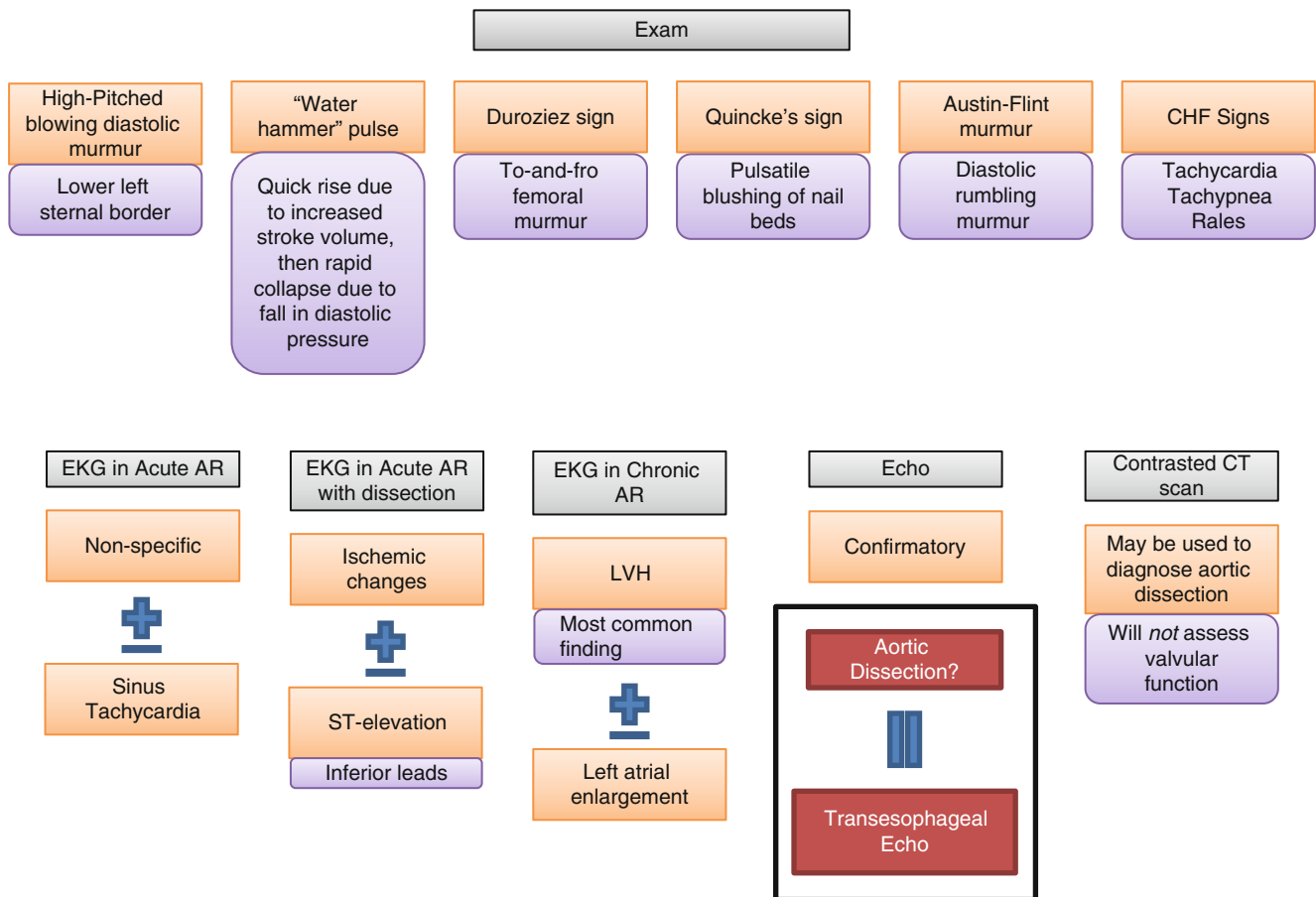
Aortic Regurgitation



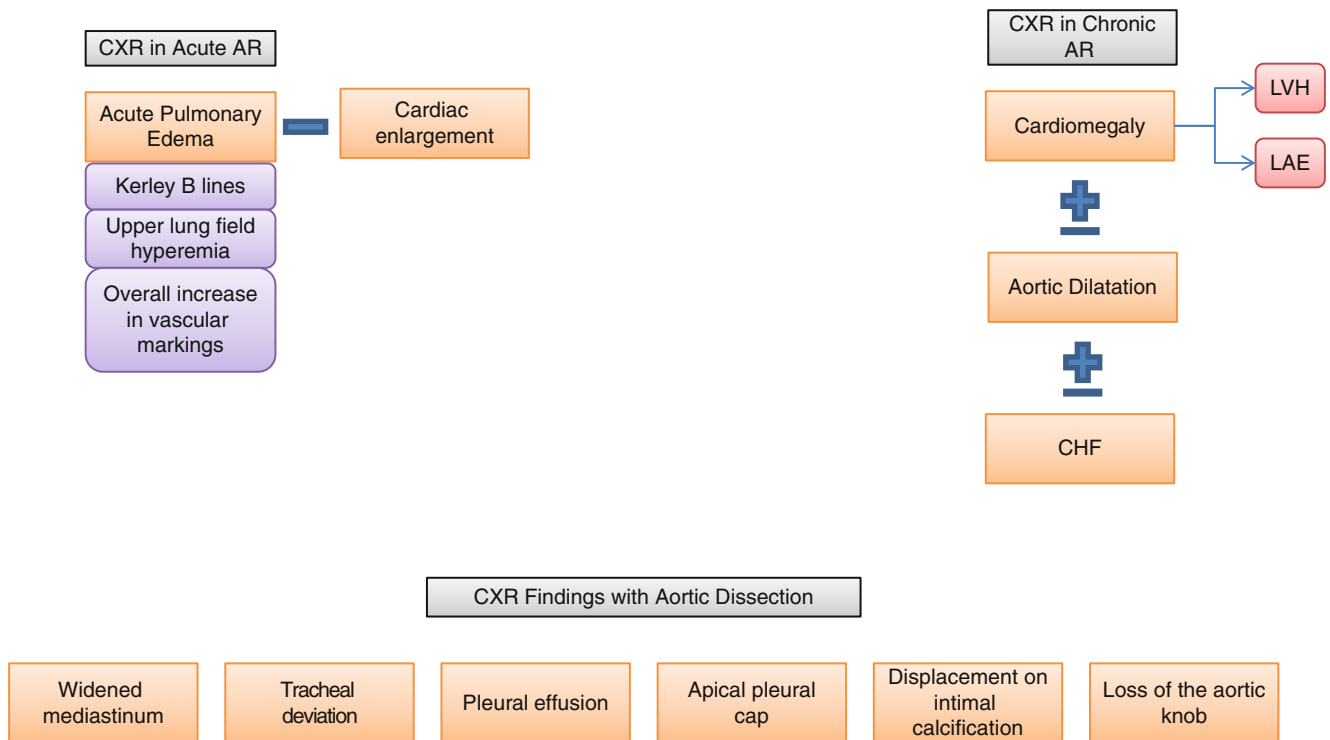
Aortic Regurgitation Symptoms



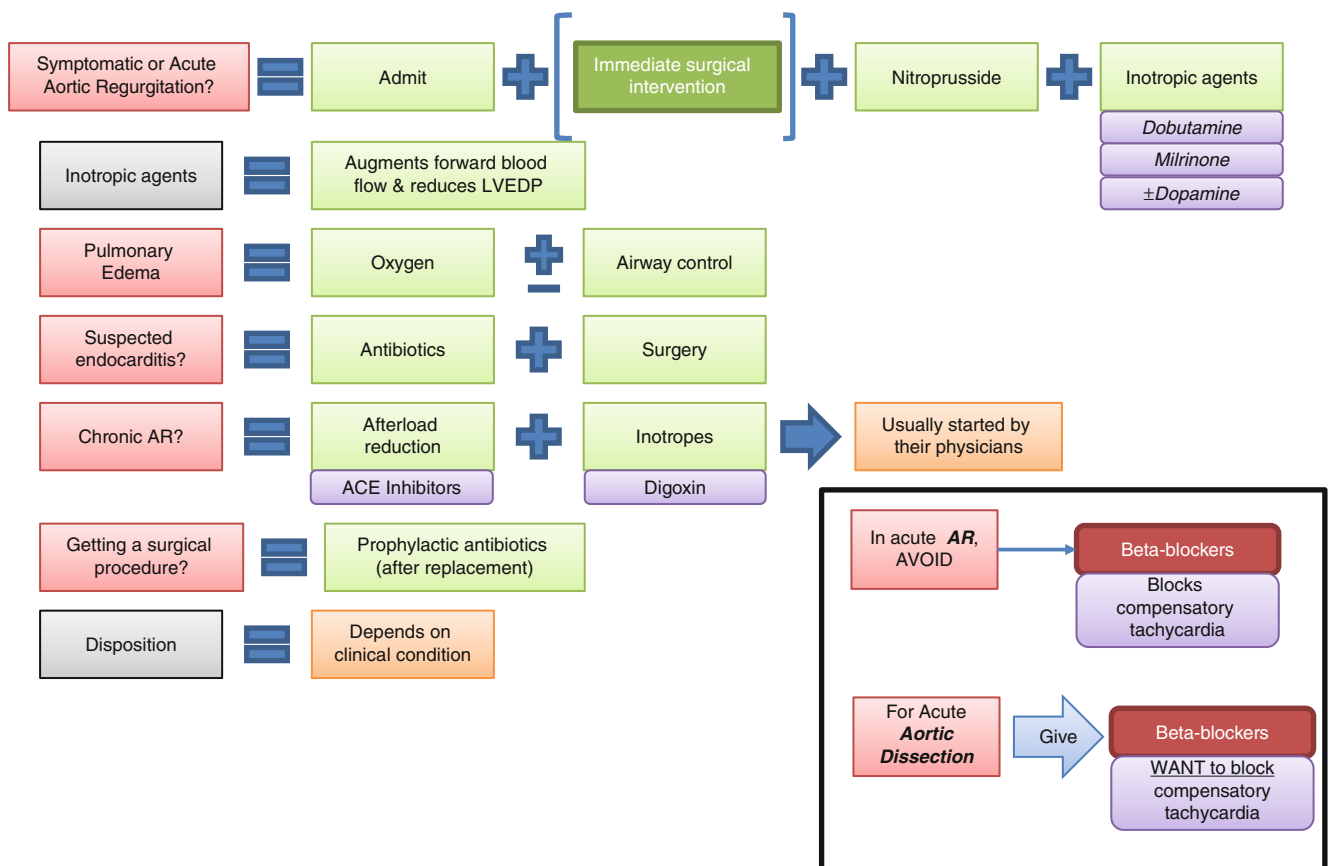
Aortic Regurgitation Diagnosis



The CXR in Aortic Regurgitation

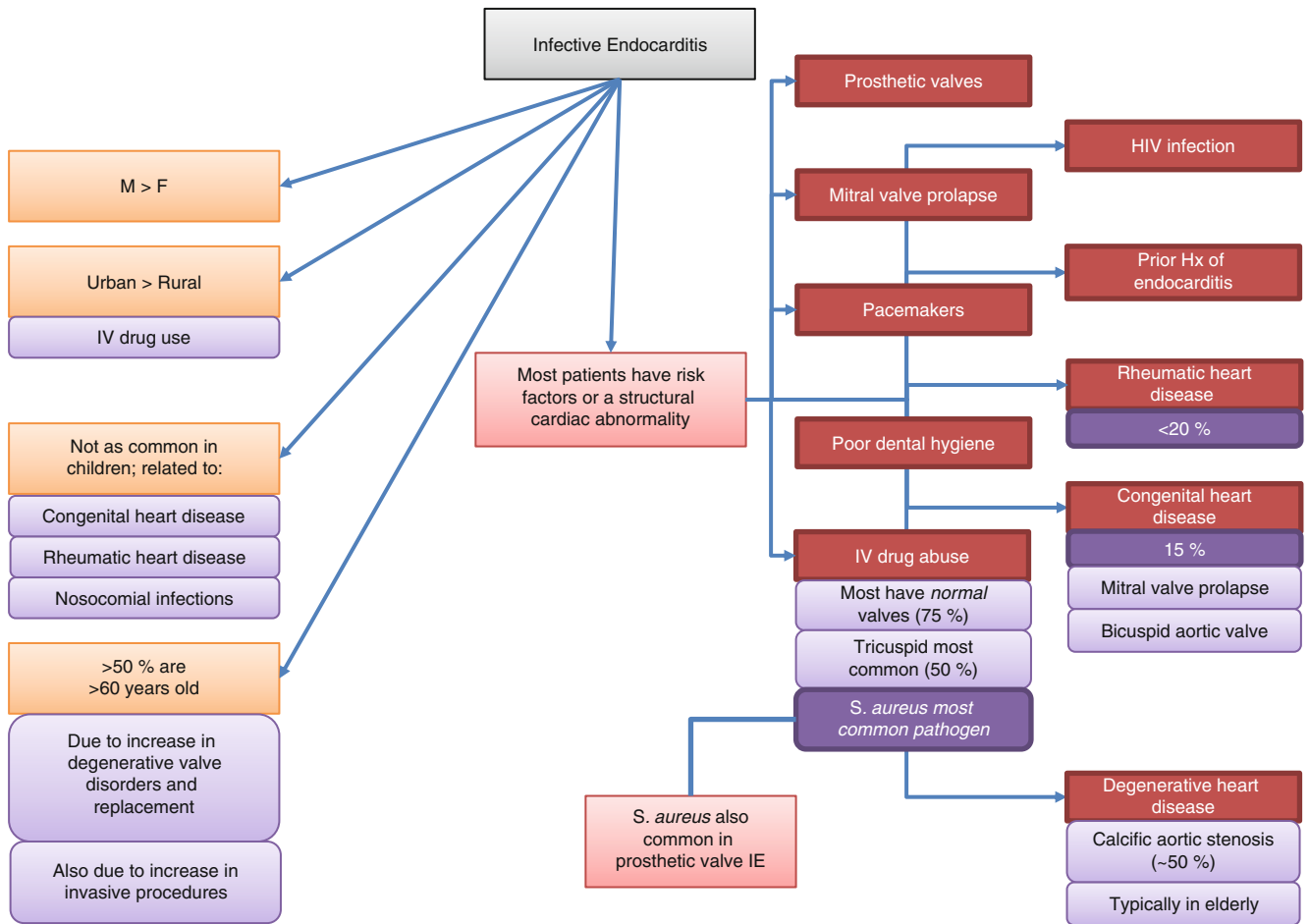


Aortic Regurgitation Treatment

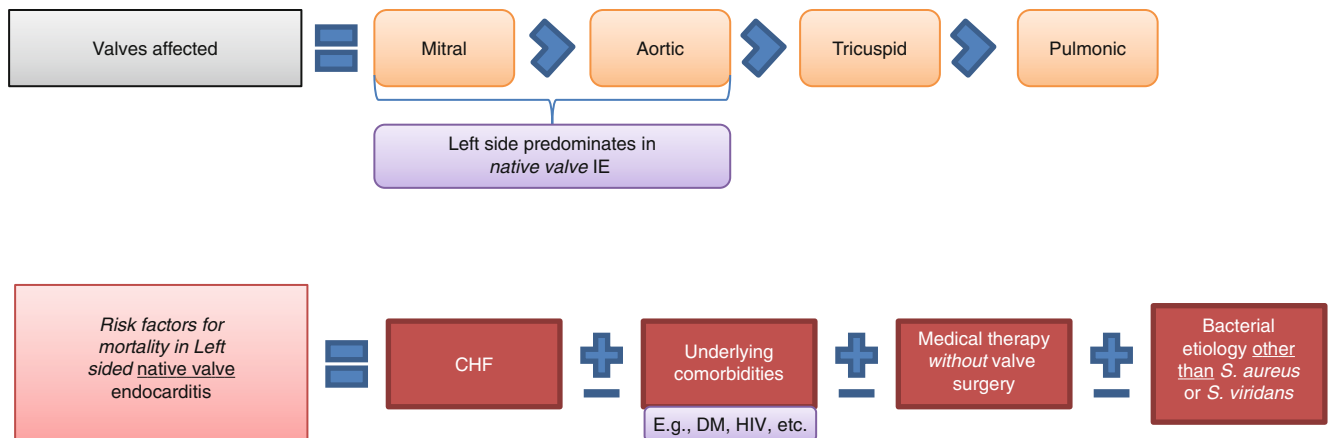


Infective Endocarditis

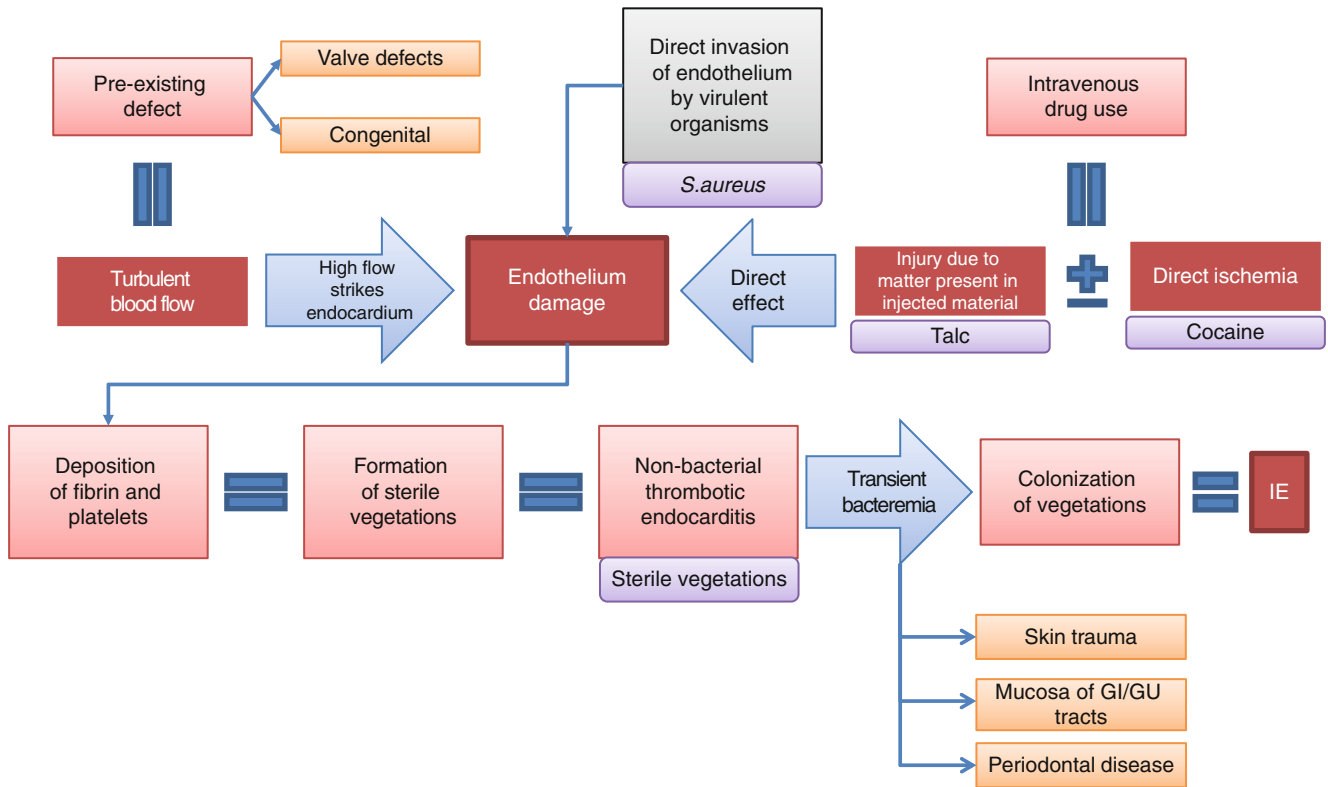
Introduction



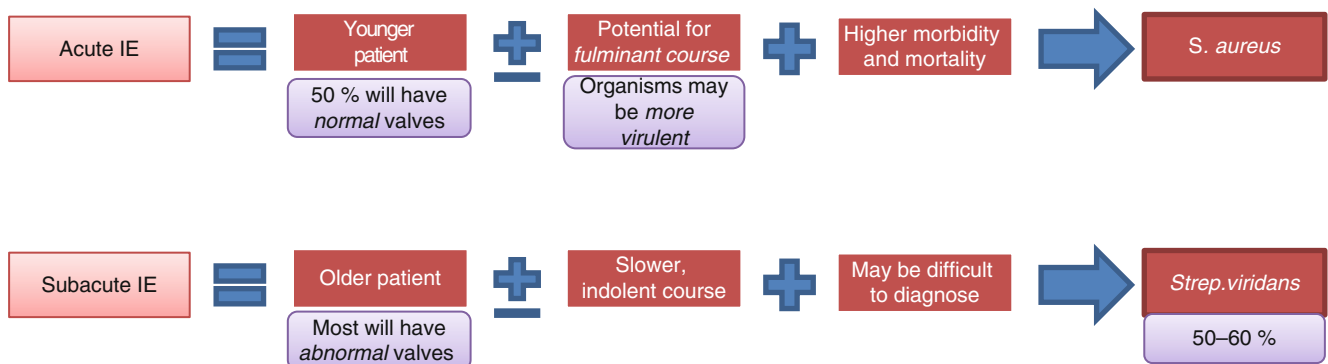
Introduction (2)



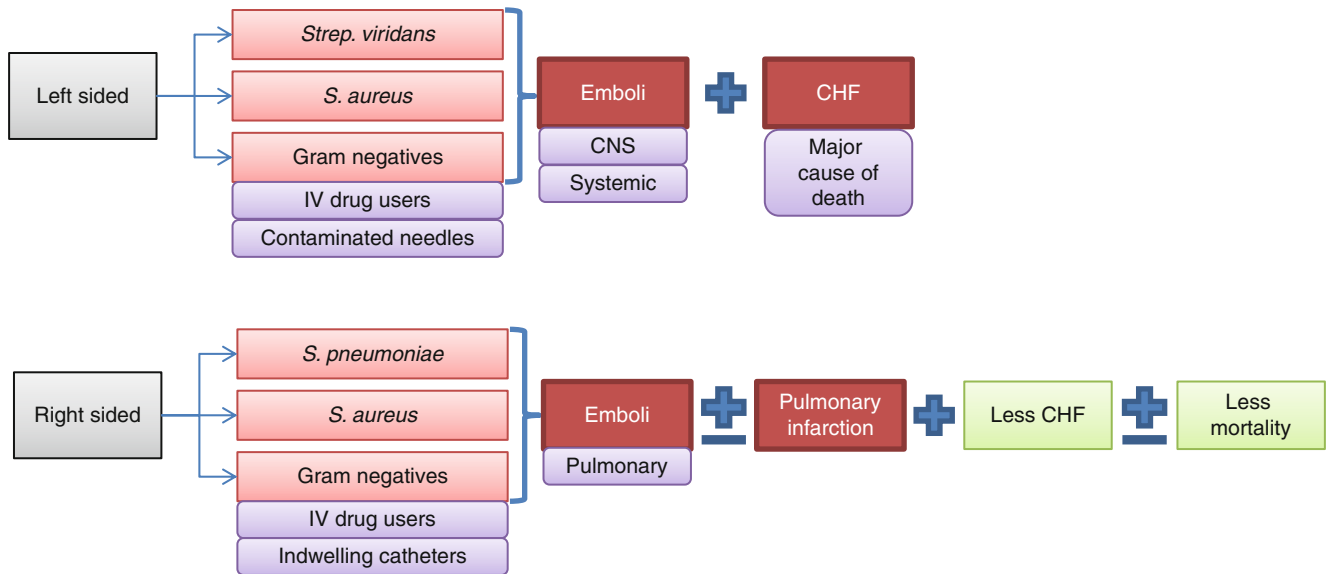
Pathophysiology



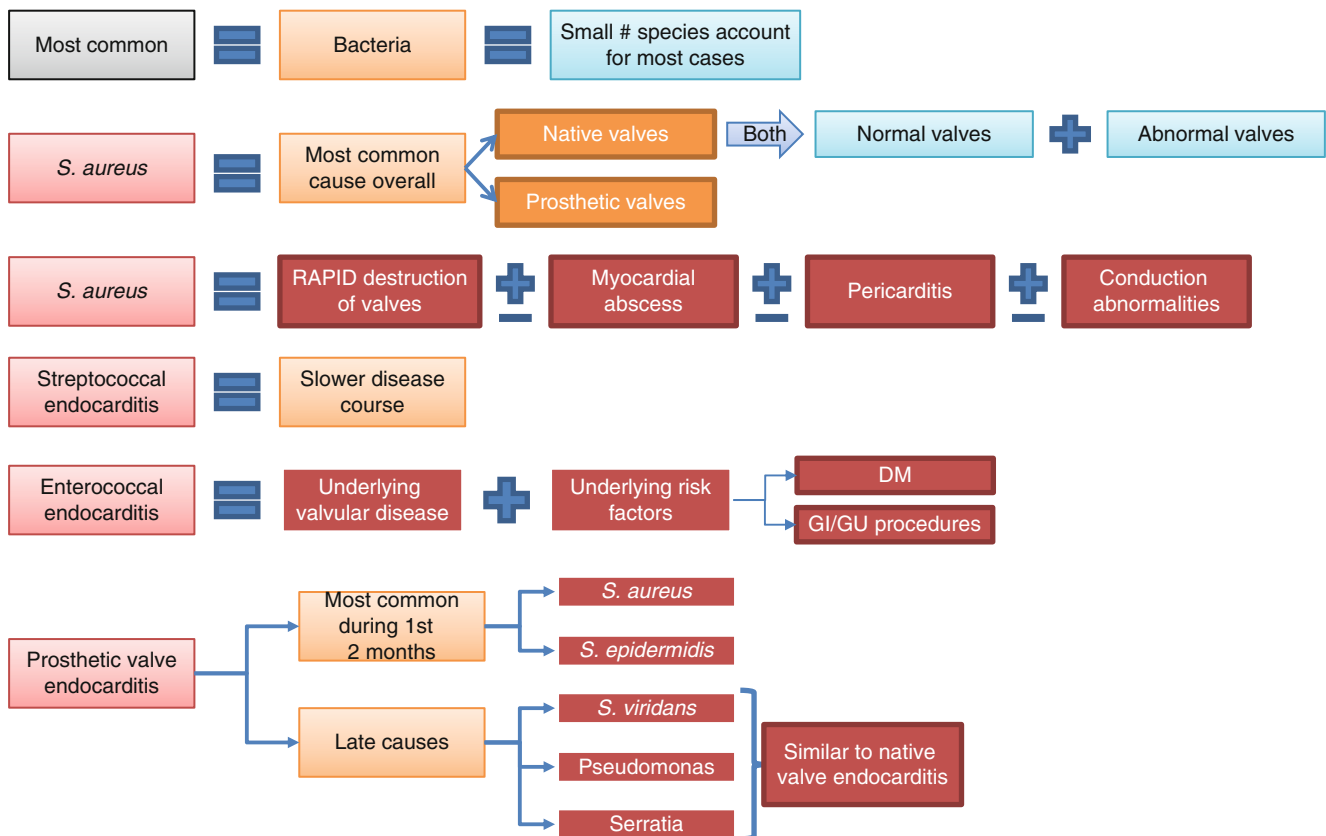
Acute Versus Subacute Endocarditis



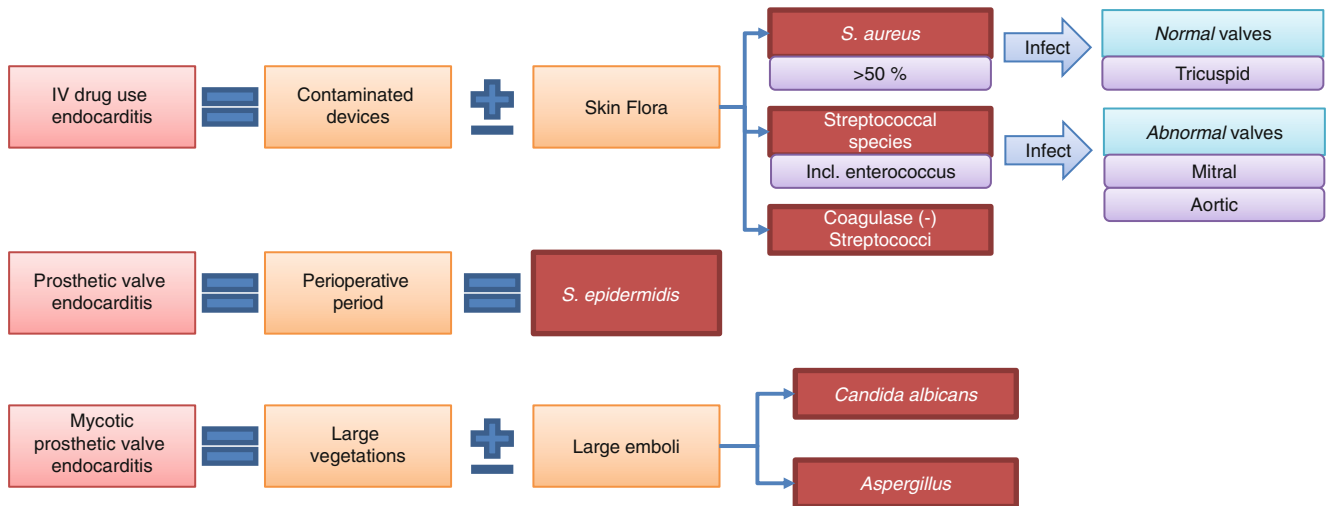
Left-Sided Versus Right-Sided Endocarditis



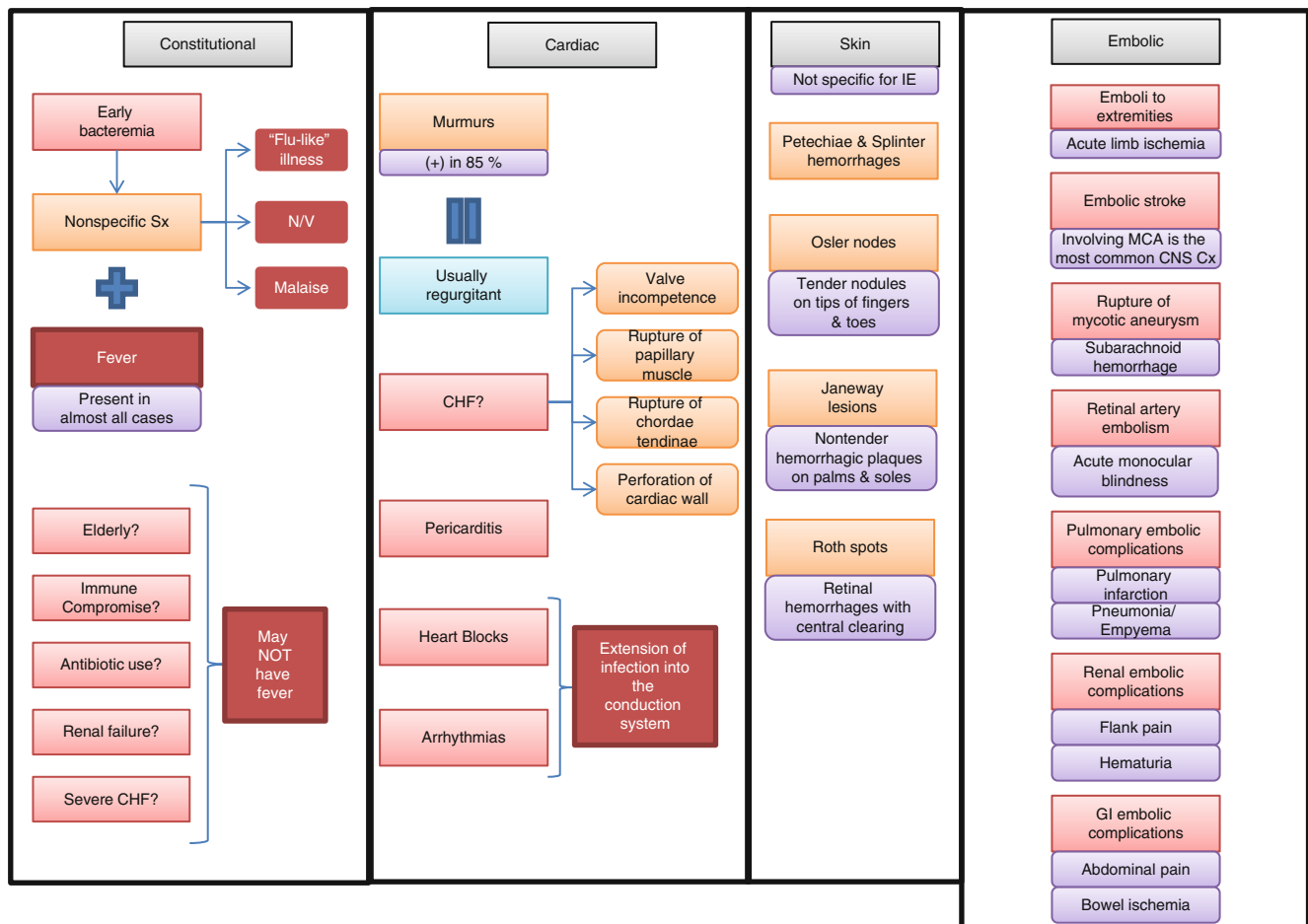
Organisms



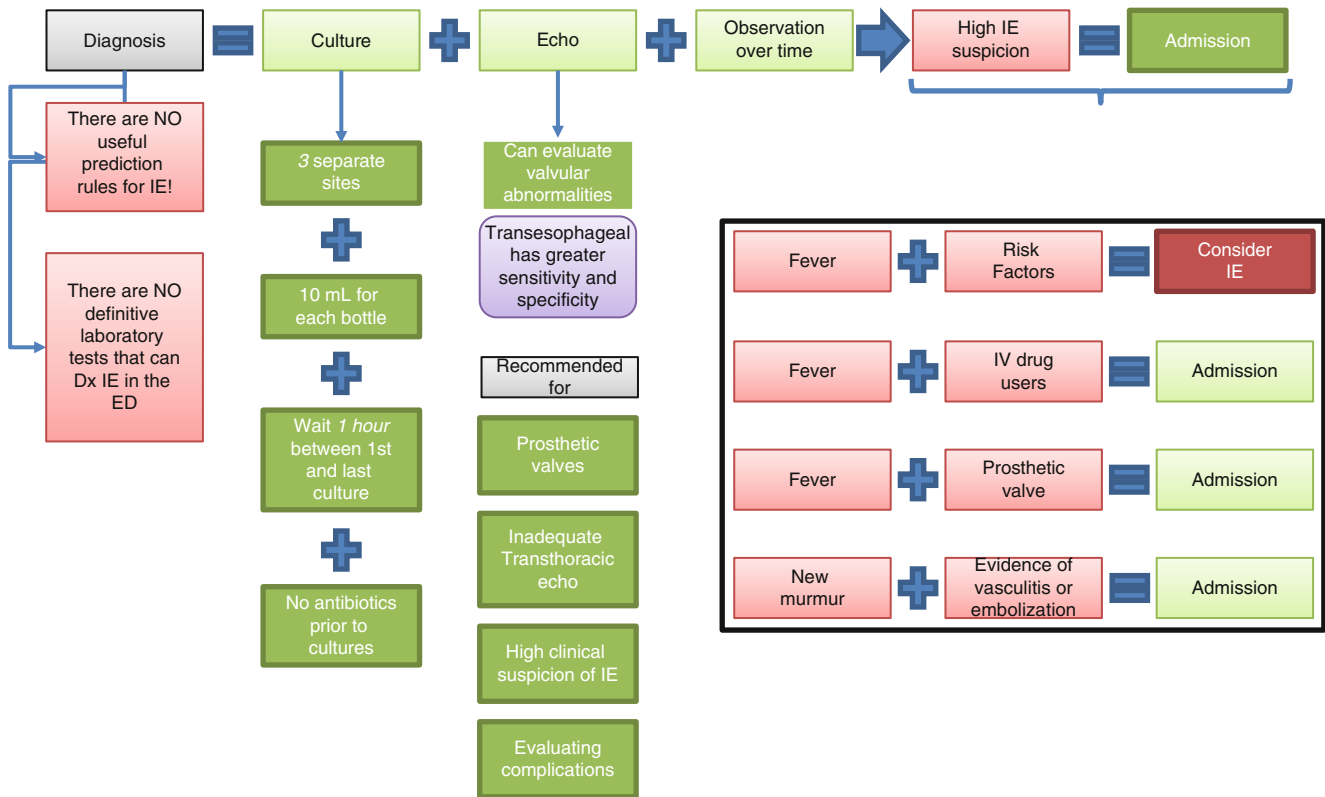
Organisms (2)



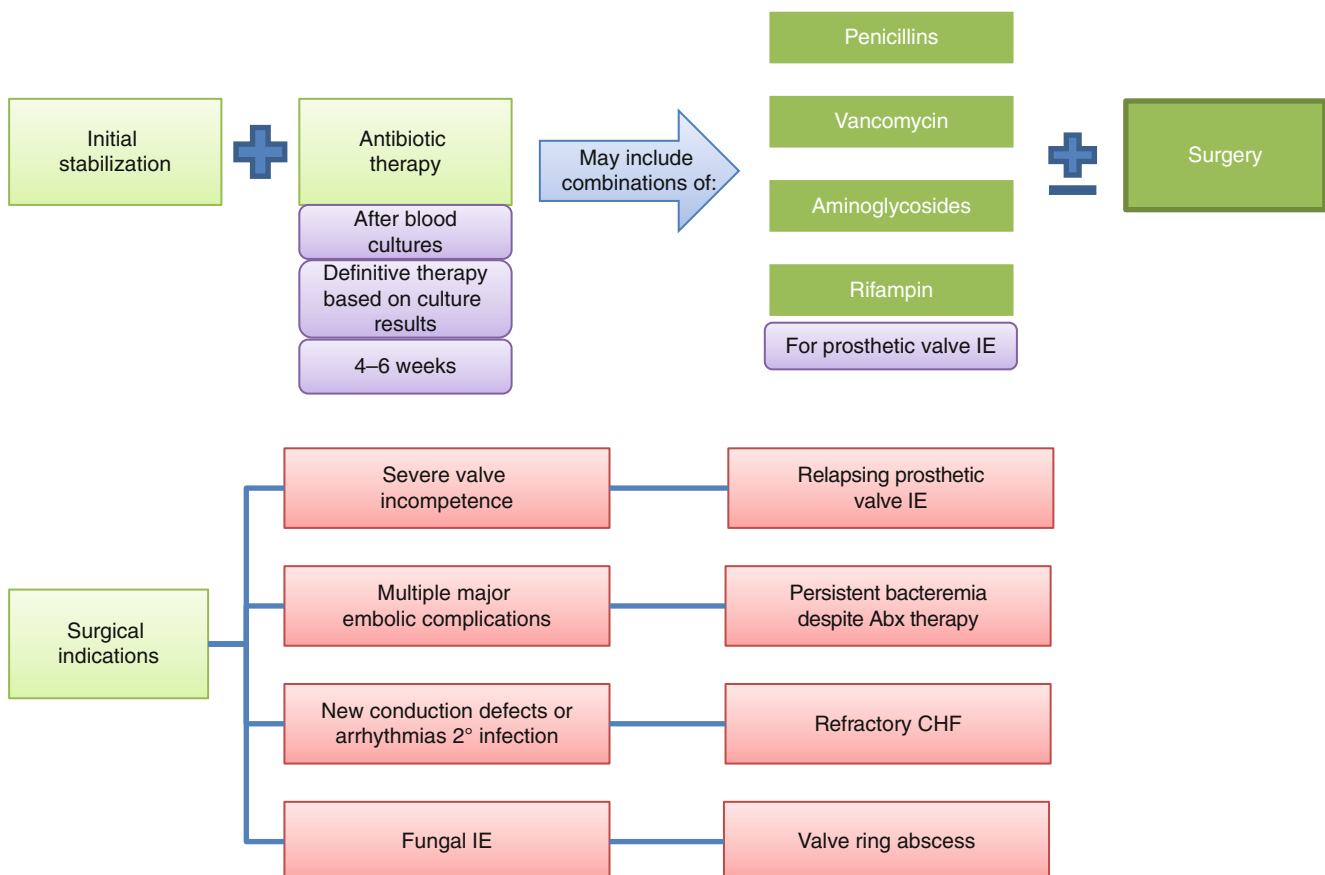
Clinical Findings



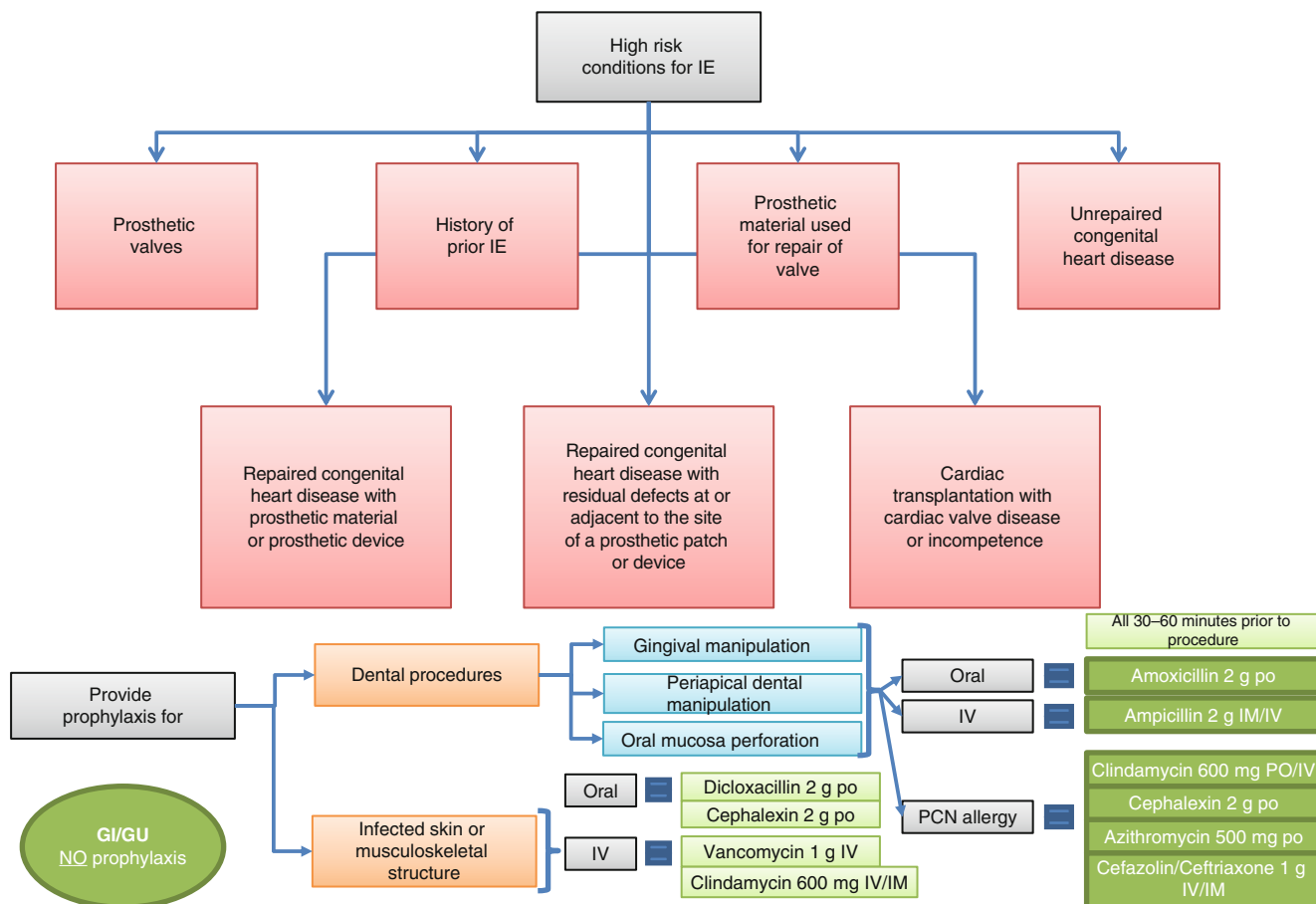
Diagnosis



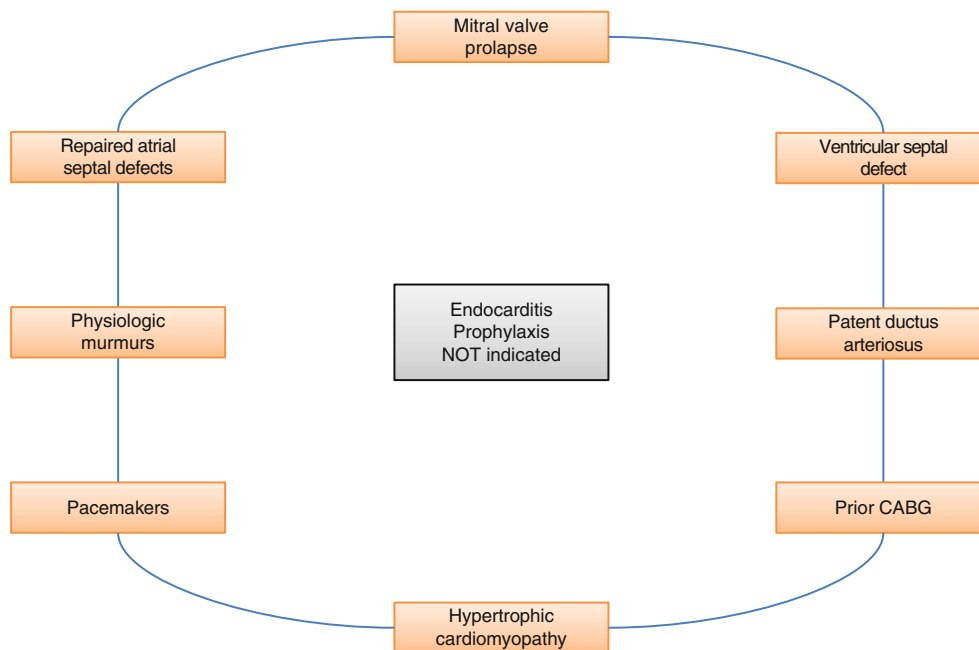
Treatment



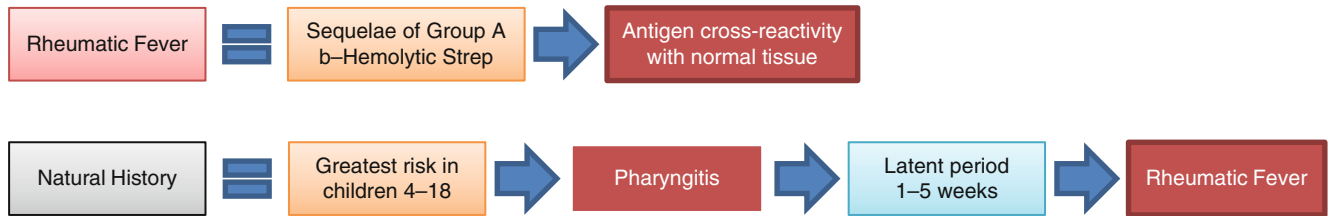
Endocarditis Prophylaxis



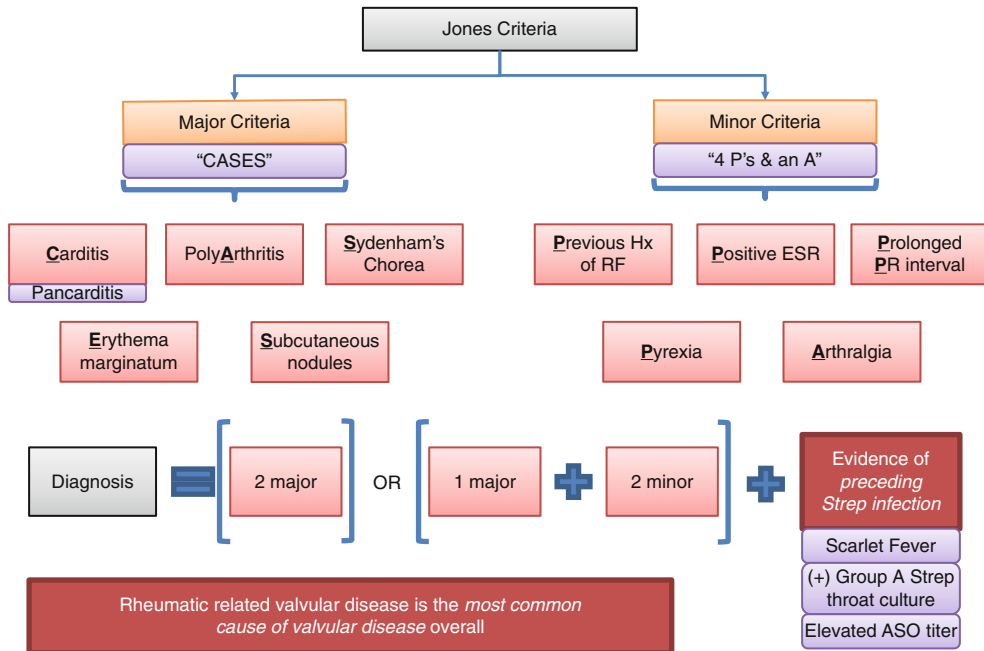
Endocarditis Prophylaxis NOT Indicated

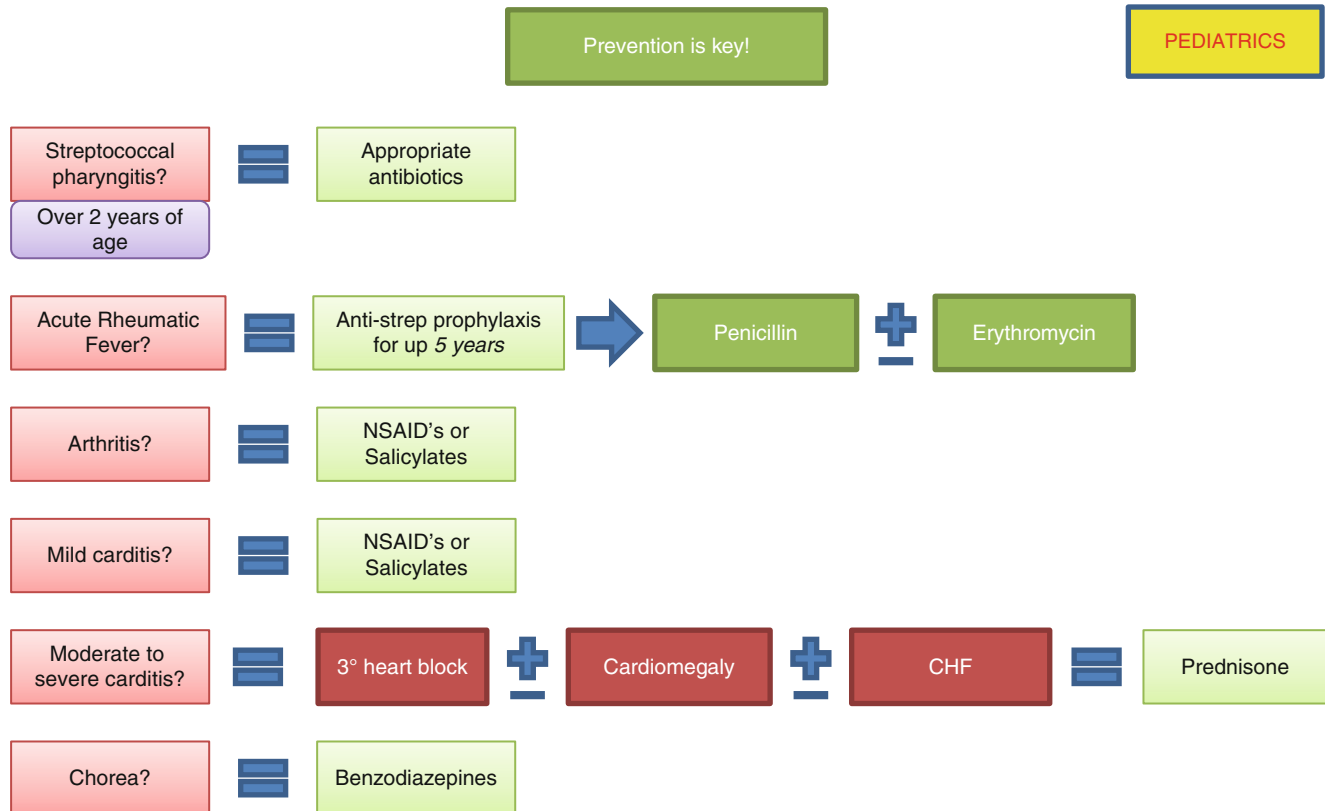


Rheumatic Heart Disease



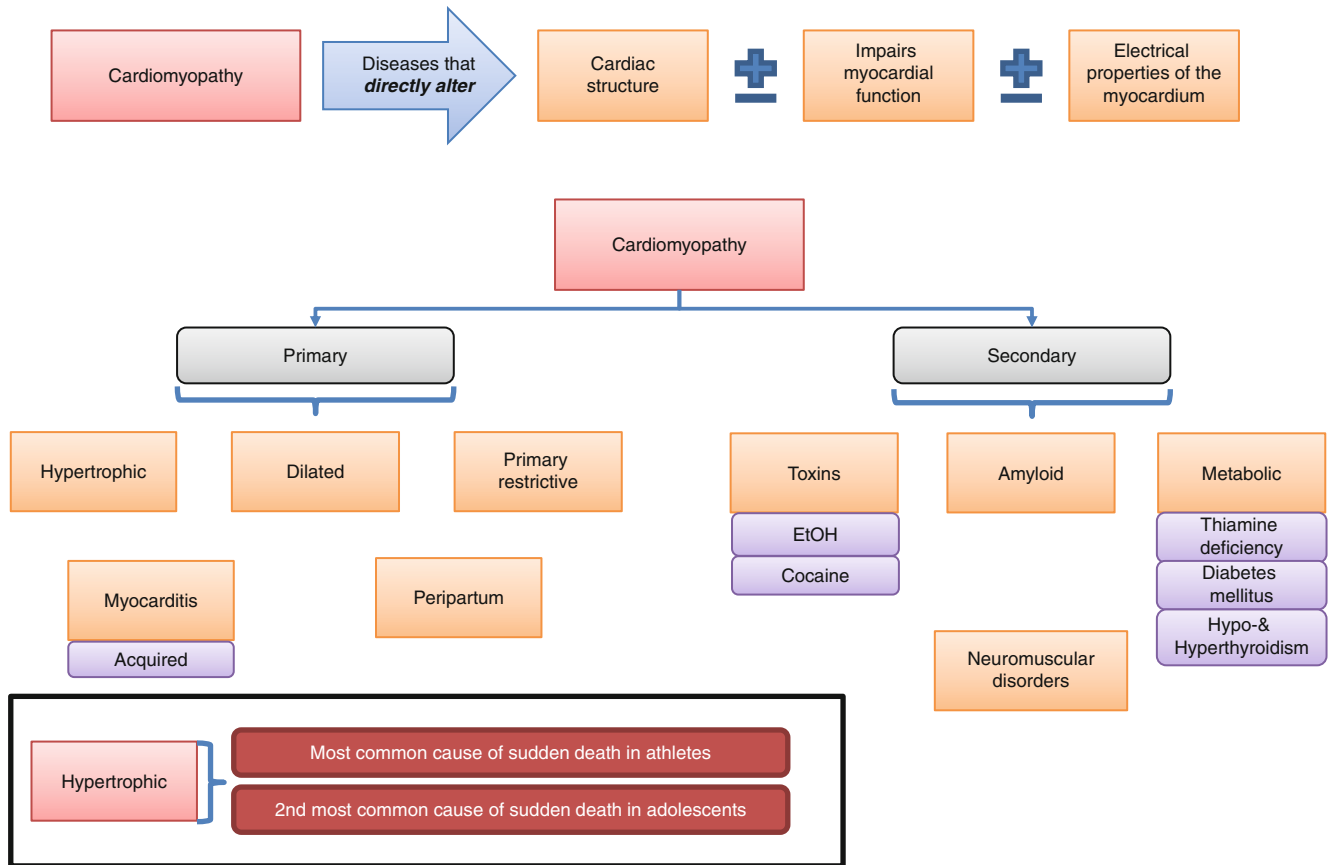
Rheumatic Heart Disease: Diagnosis



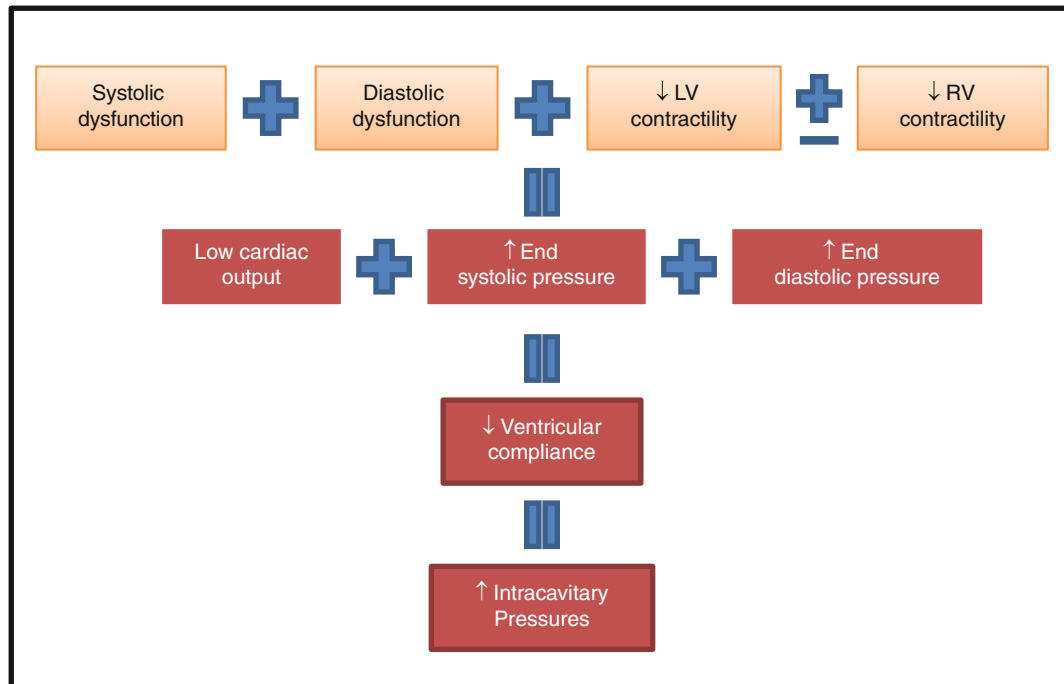
Rheumatic Heart Disease: Treatment

Cardiomyopathies (CM)

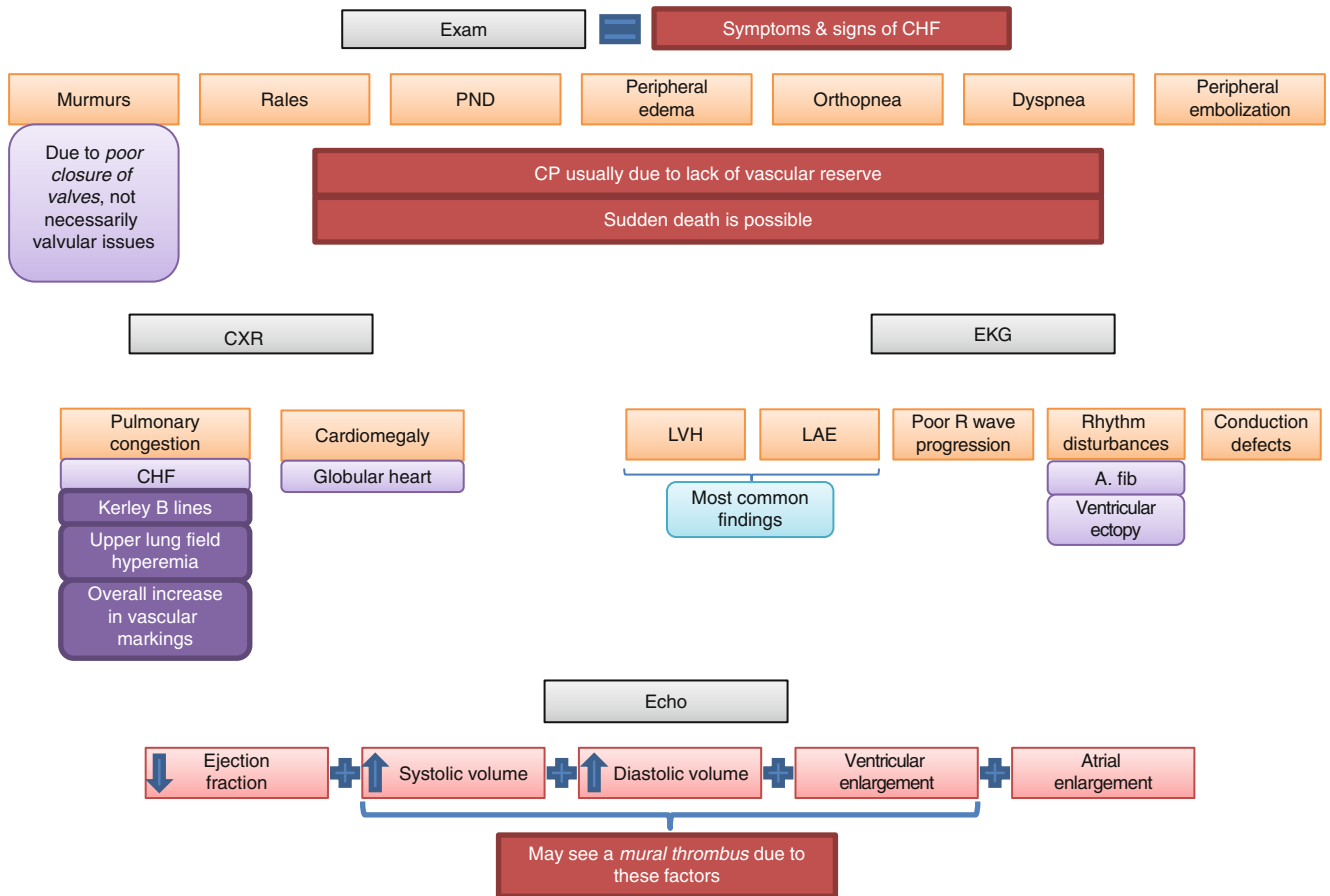
Cardiomyopathy: General



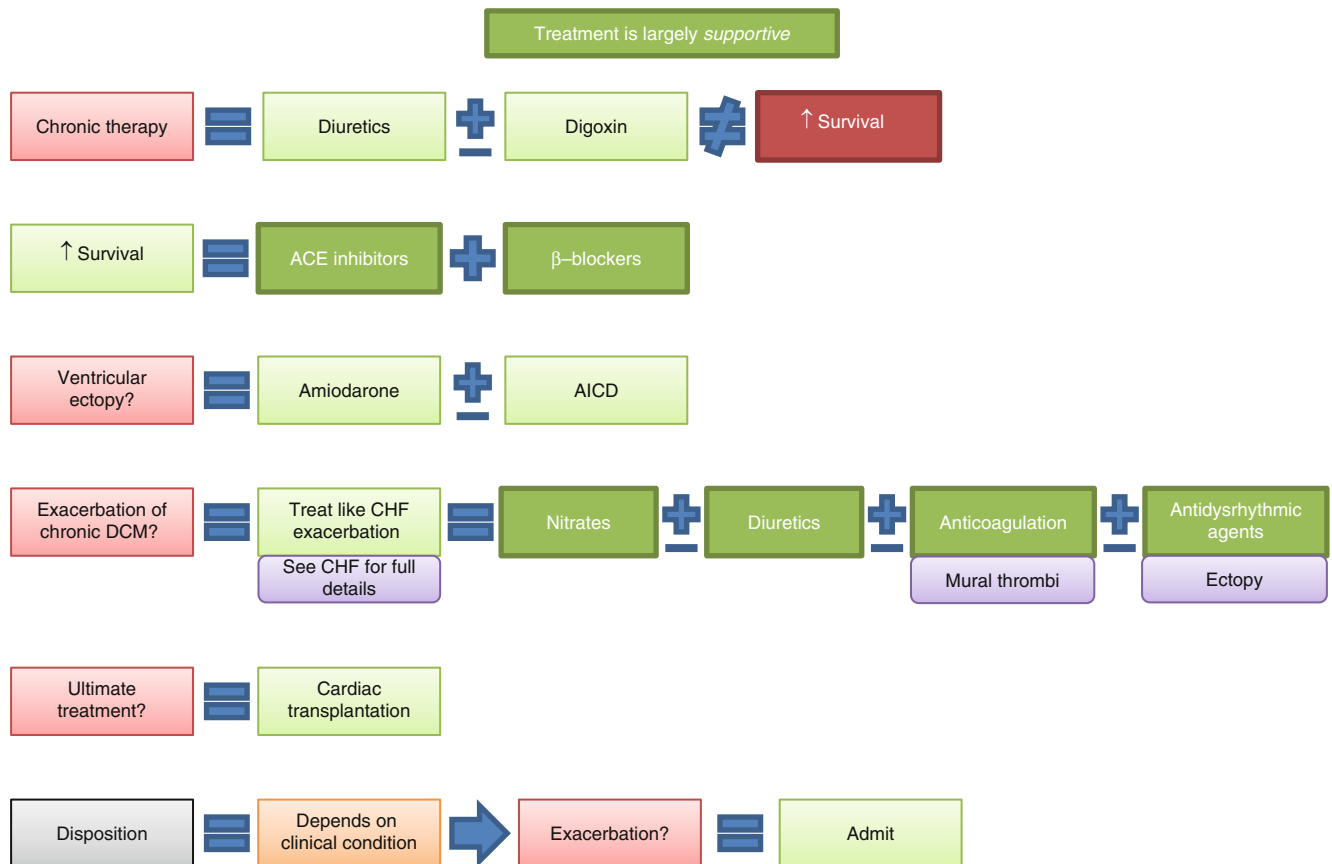
Dilated Cardiomyopathy



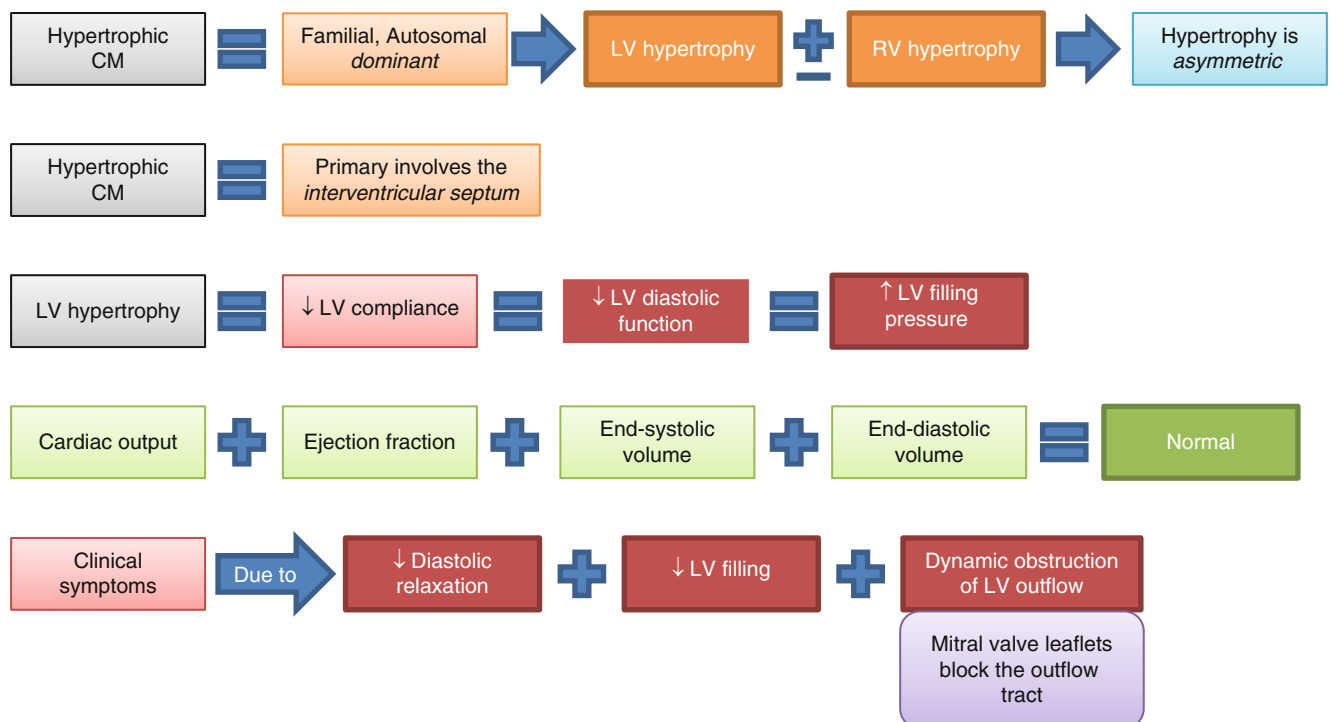
Dilated Cardiomyopathy: Clinical Features



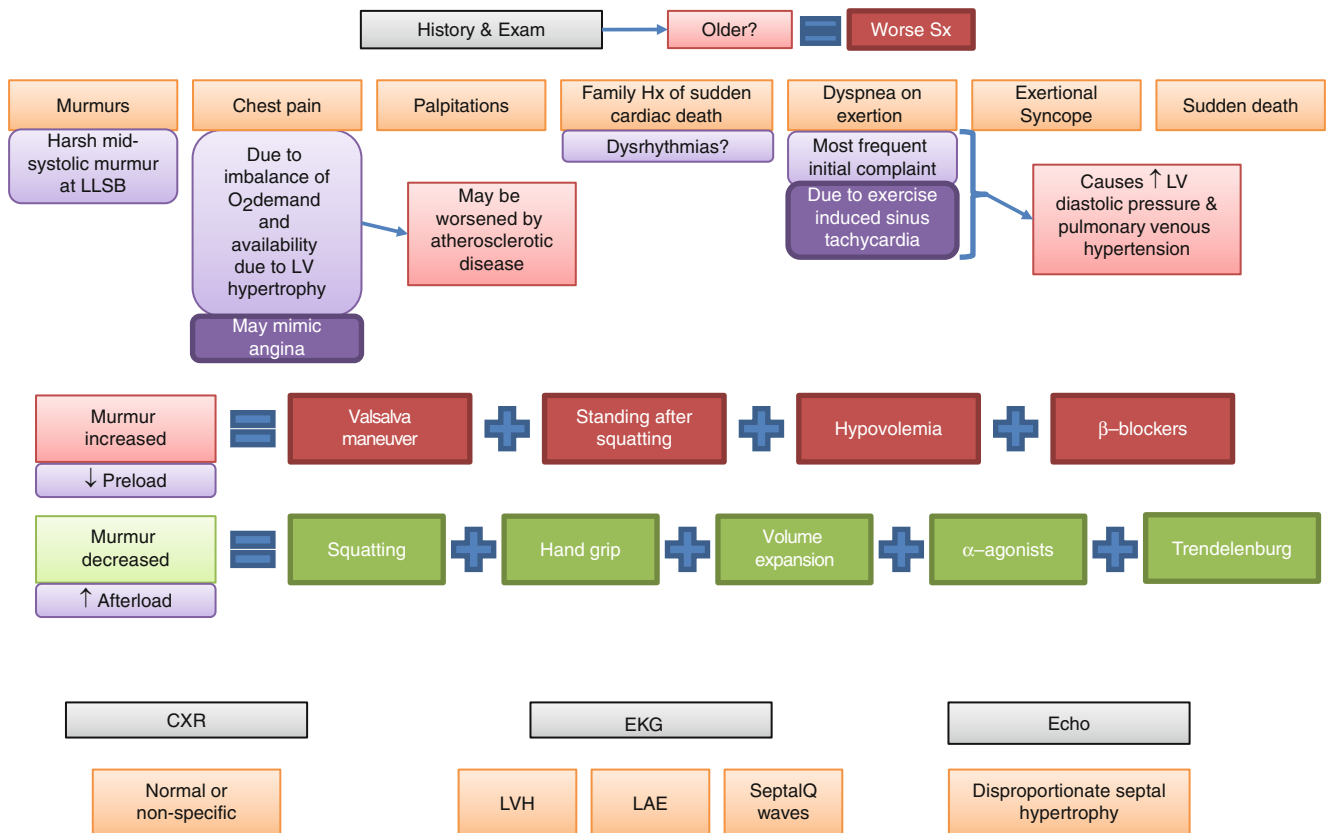
Dilated Cardiomyopathy: Treatment



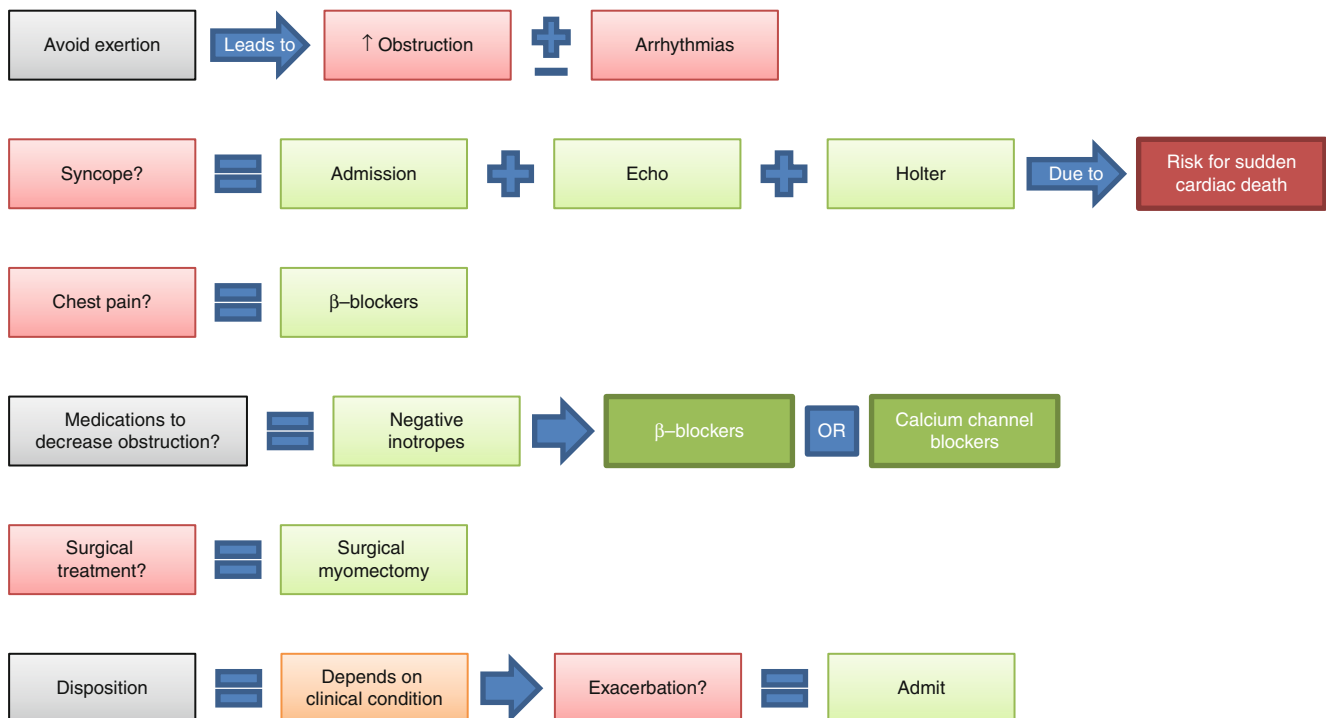
Hypertrophic Cardiomyopathy



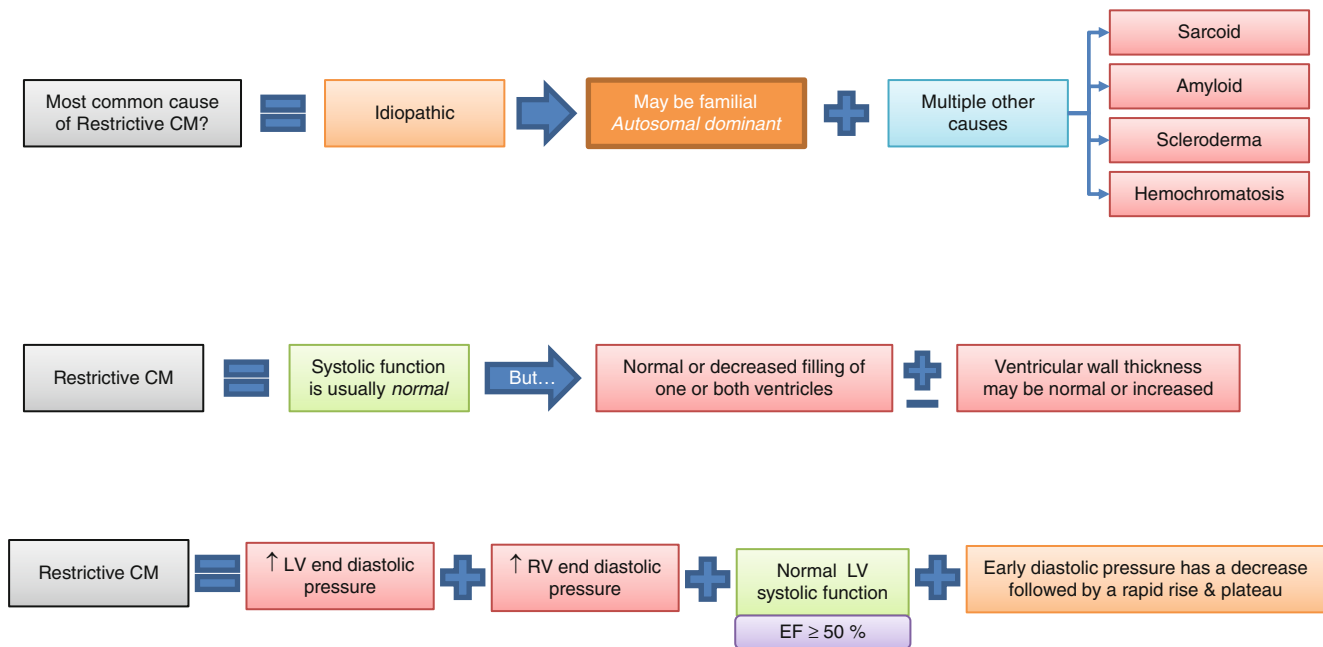
Hypertrophic Cardiomyopathy: Clinical Features



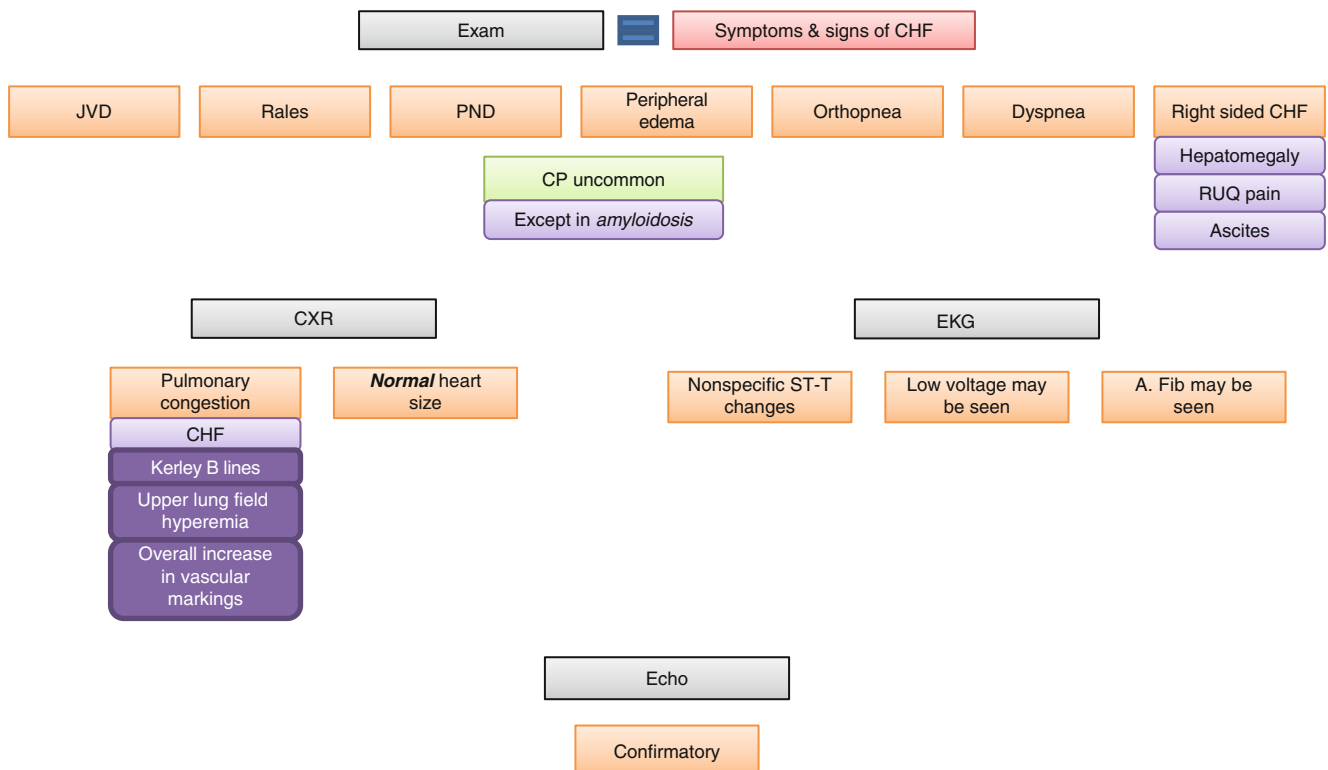
Hypertrophic Cardiomyopathy: Treatment



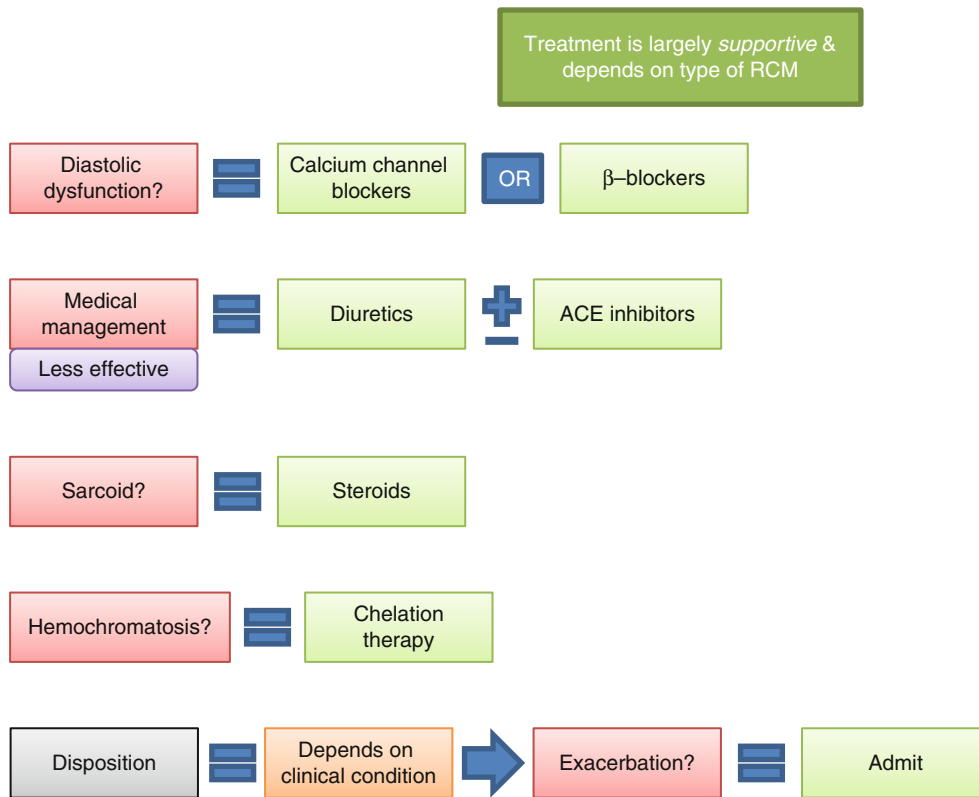
Restrictive Cardiomyopathy



Restrictive Cardiomyopathy: Clinical Features

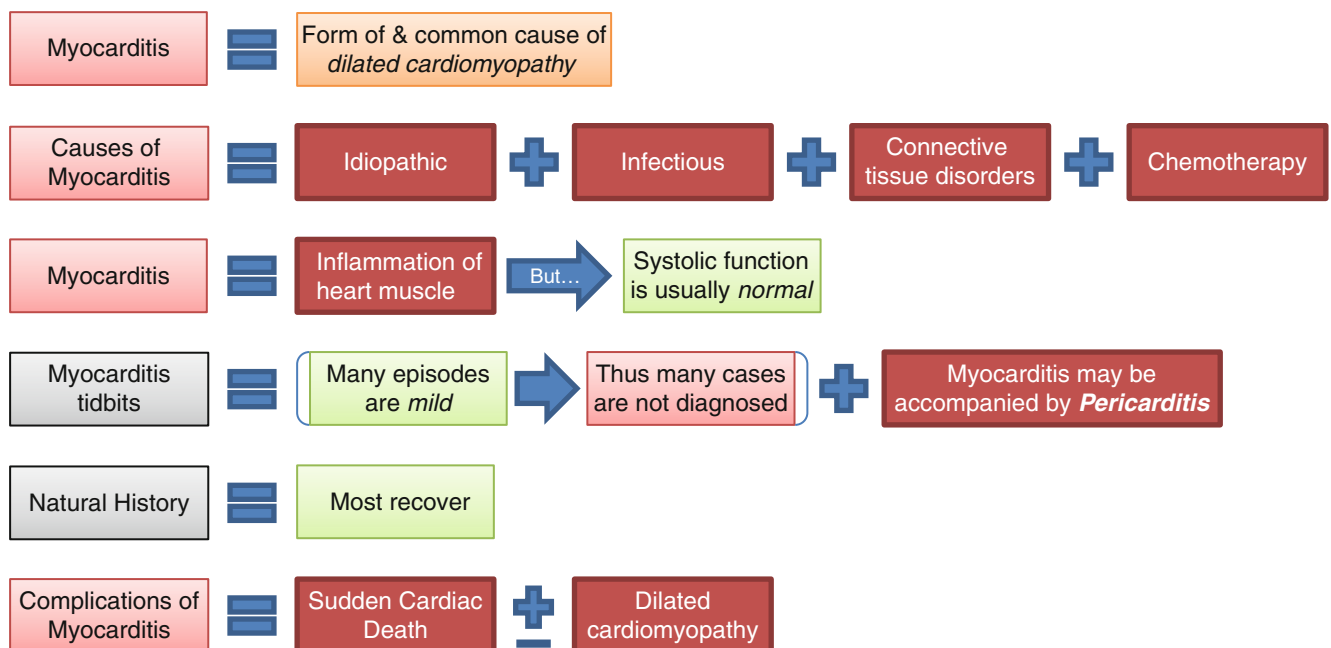


Restrictive Cardiomyopathy: Treatment

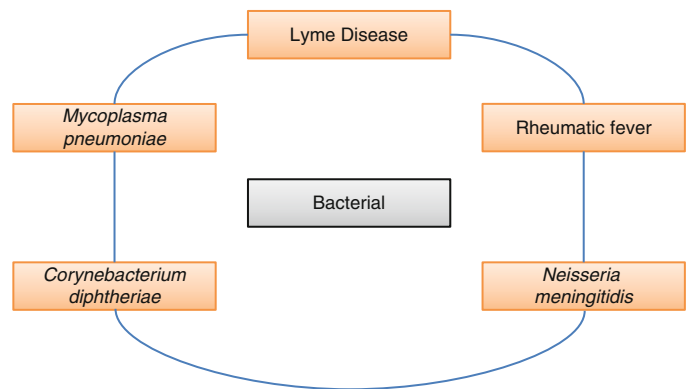
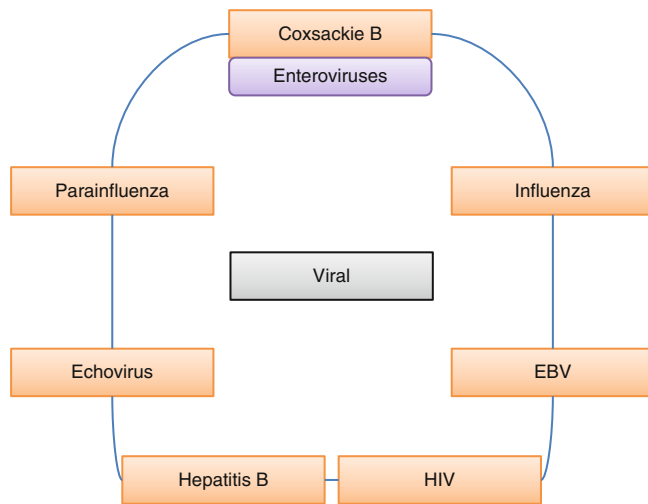


Myocarditis

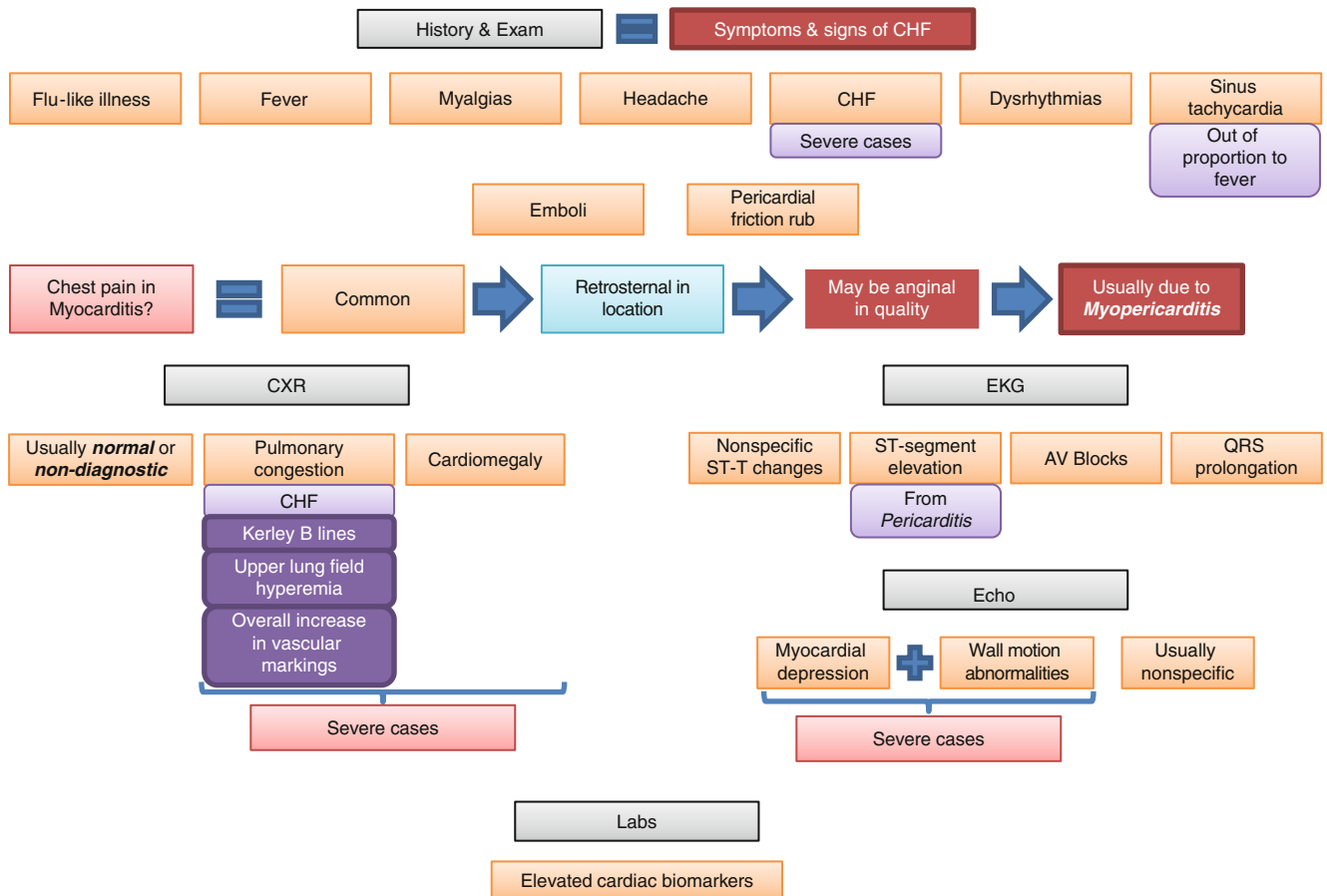
Introduction



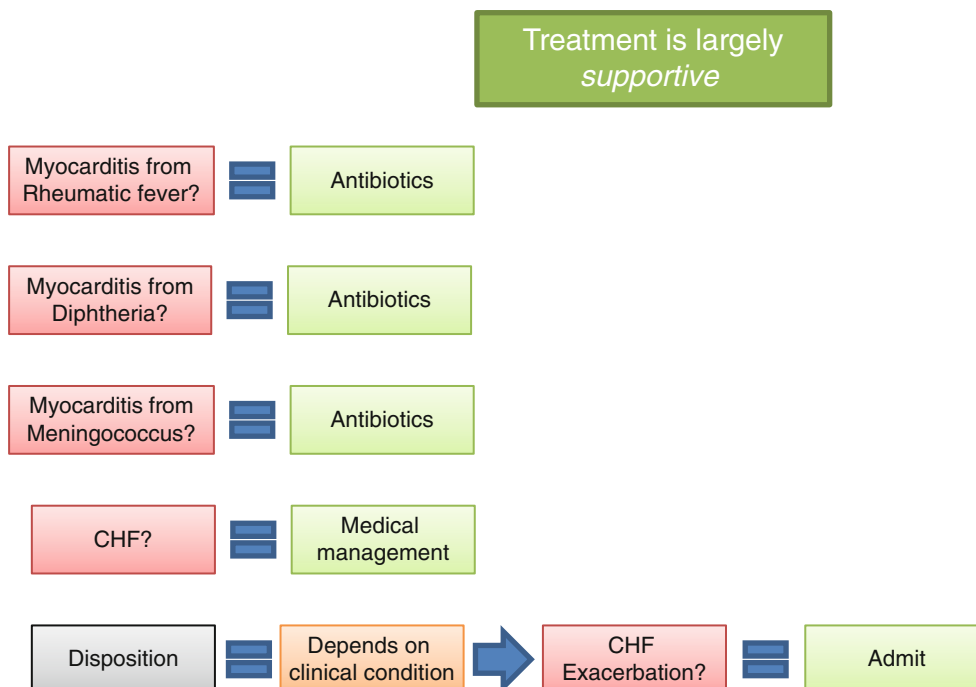
Infectious Causes of Myocarditis



Myocarditis: Clinical Features

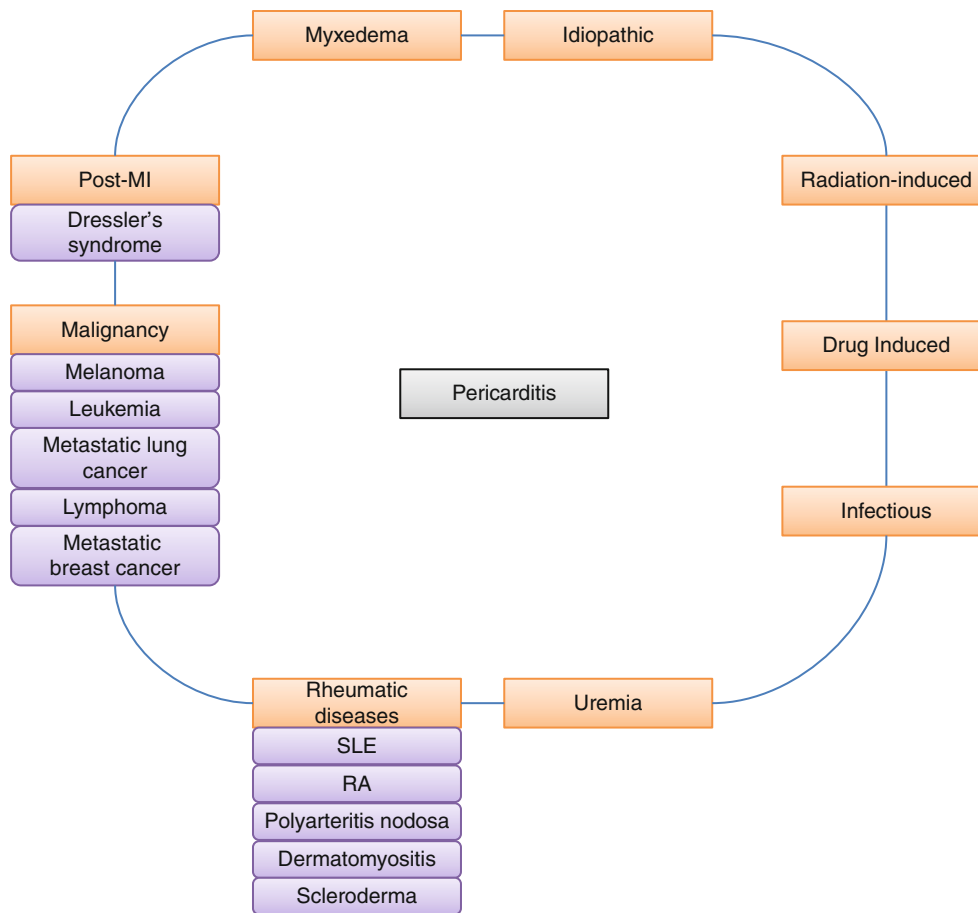


Myocarditis: Treatment

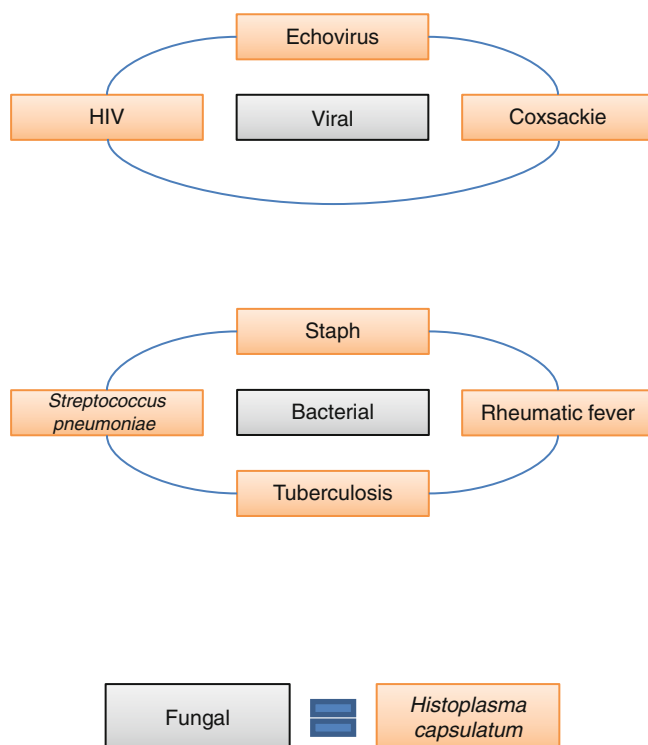


Pericarditis

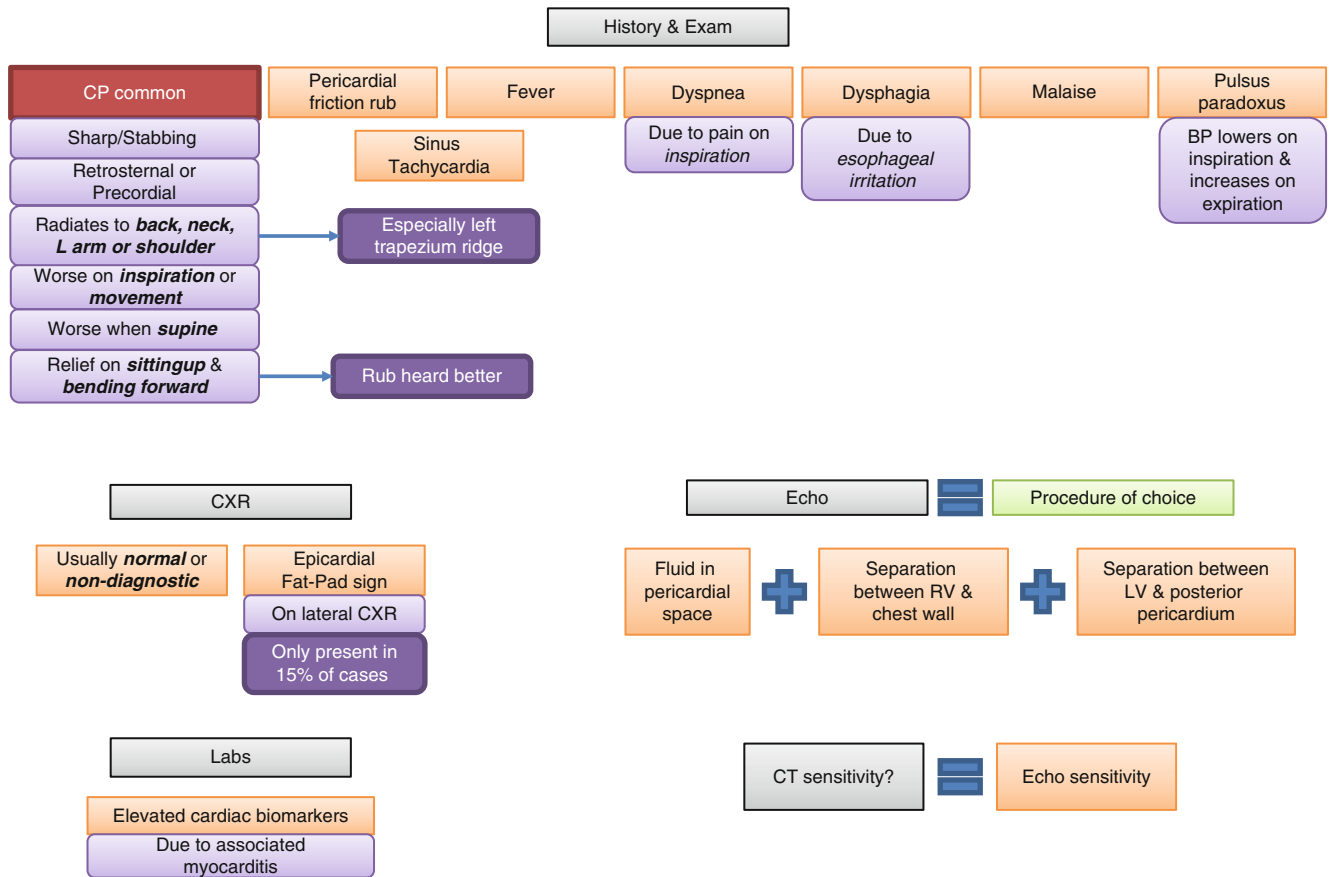
Causes of Pericarditis



Infectious Causes of Pericarditis



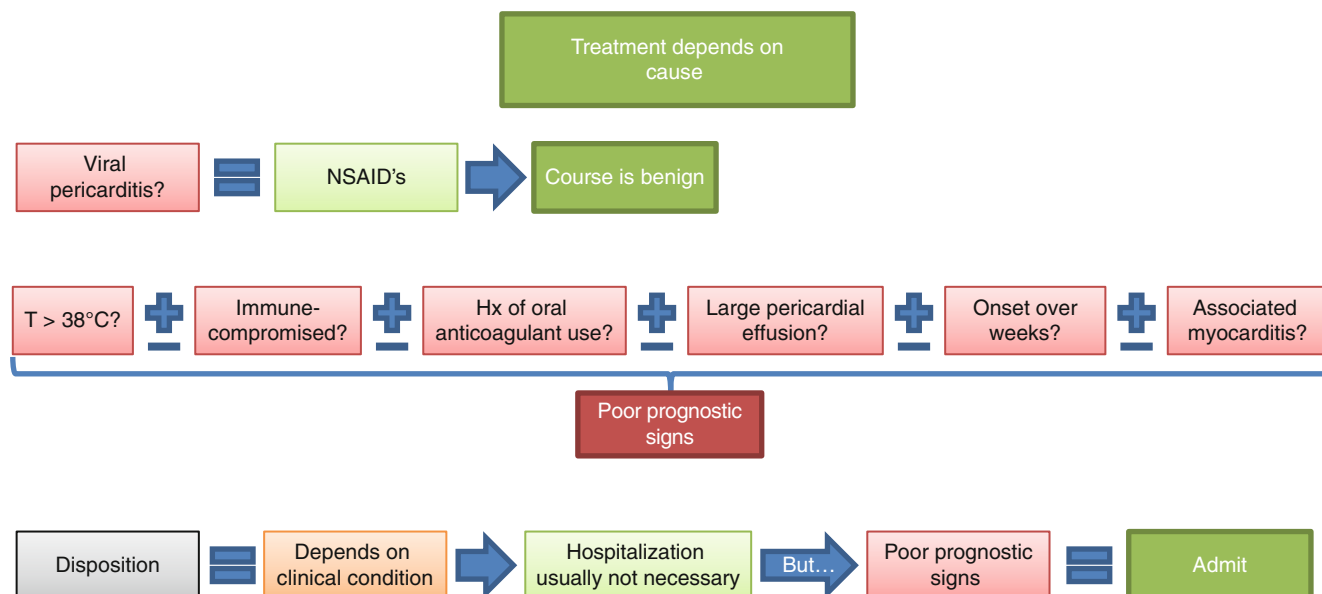
Pericarditis: Clinical Features and Diagnosis



Pericarditis: EKG Changes

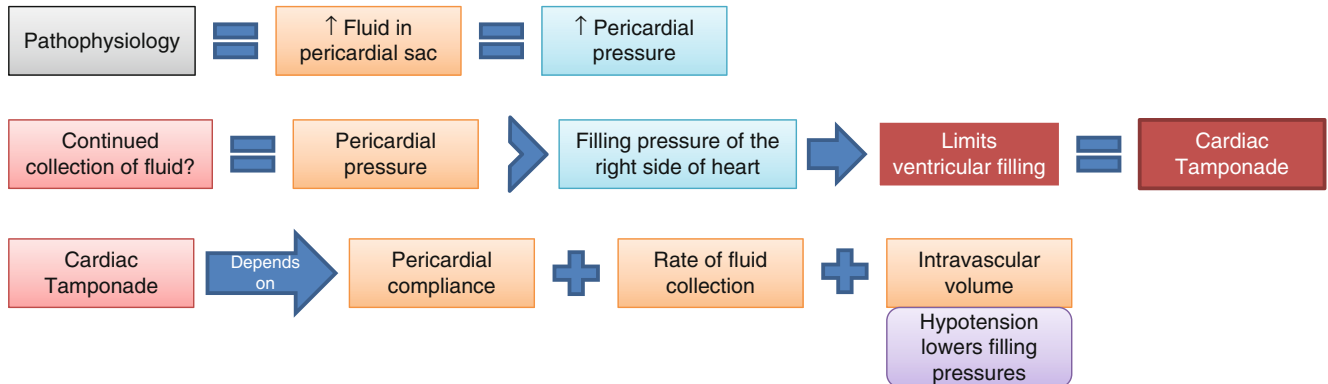
Stage	PR Segment	ST Segment	T wave	
1	Depression , especially in II, aVF& V4–V6	Diffuse elevation (does not correlate with coronary distribution)	N/A	<div>ST amplitude: T wave amplitude >0.25</div> 
2	Returns to baseline	Returns to baseline	N/A	
3	N/A	Isoelectric	Inversions , especially in I, V5, V6	
4	N/A	Isoelectric	Normal	
<div><div>Large pericardial effusion</div><div>=</div><div><div>Low-voltage QRS complexes</div><div>Due to attenuation of electrical signals</div></div><div>+</div><div><div>Electrical Alternans</div><div>Due to pendular motion of heart within fluid filled pericardium</div></div></div>				

Pericarditis: Treatment

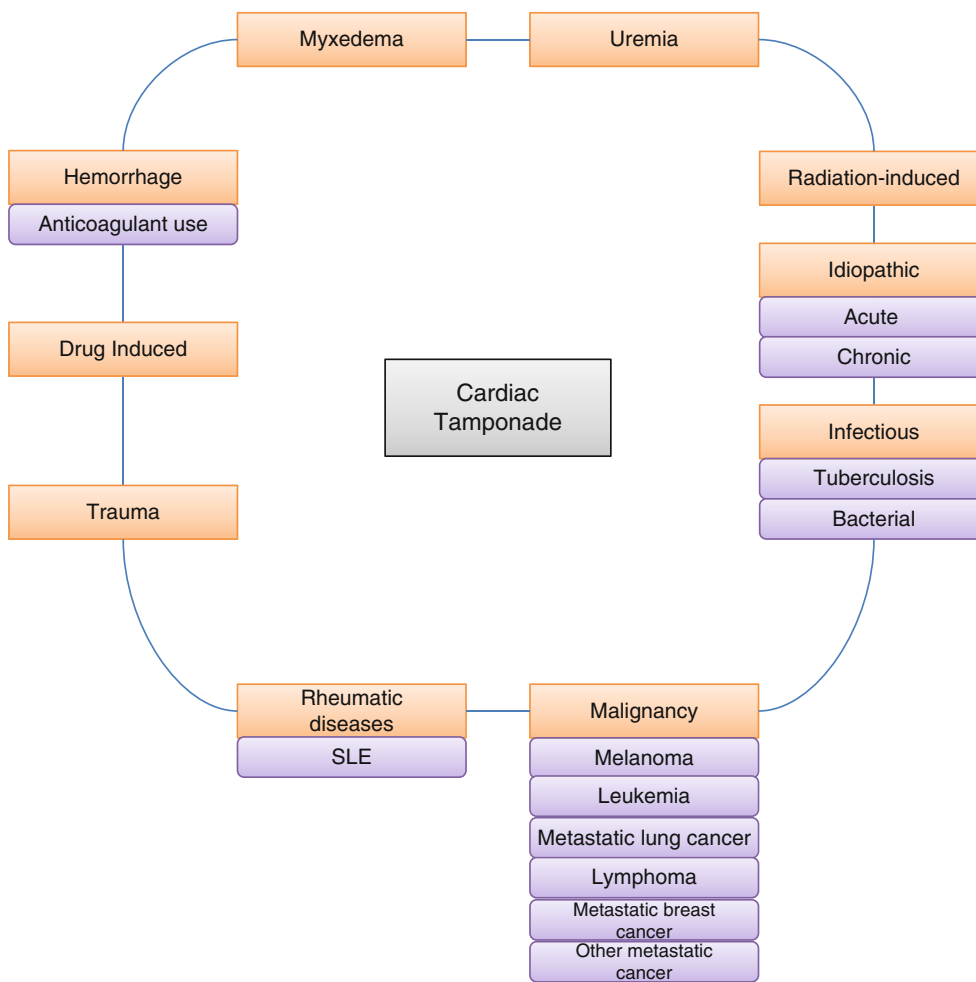


Cardiac Tamponade

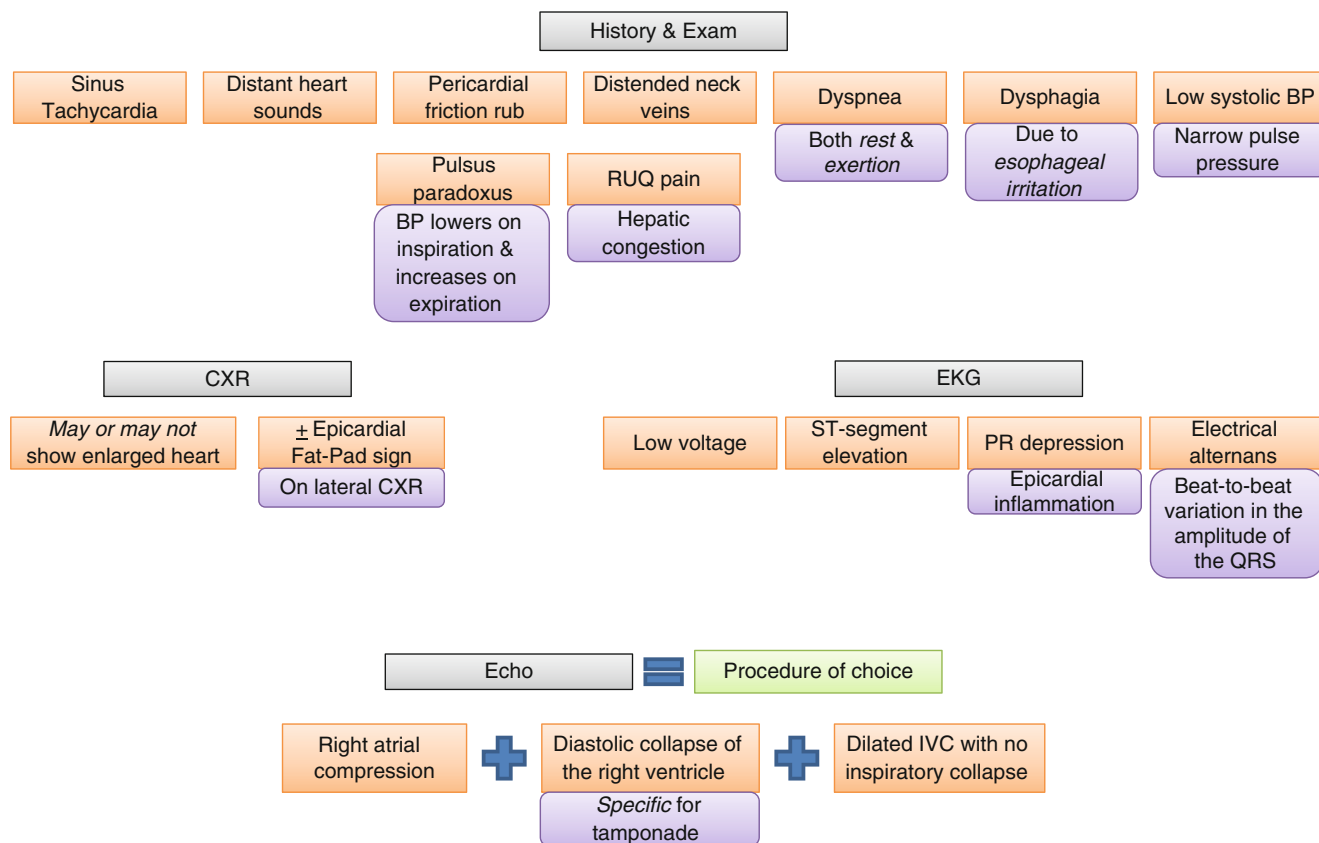
Introduction



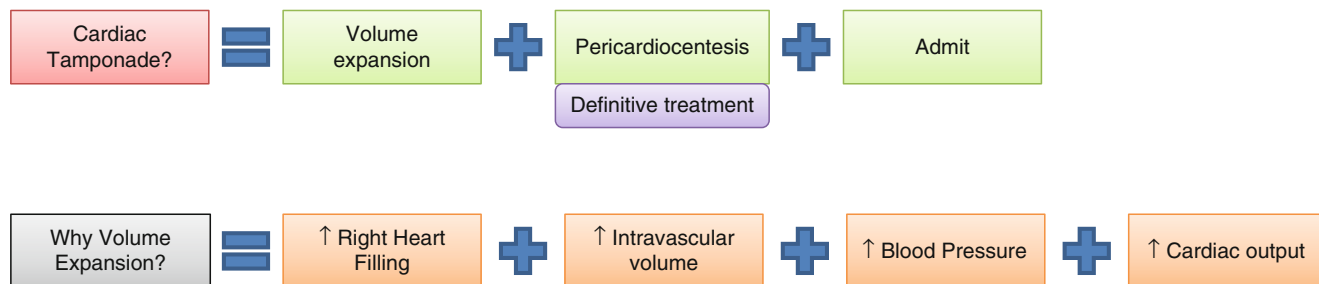
Causes of Cardiac Tamponade



Cardiac Tamponade: Clinical Features

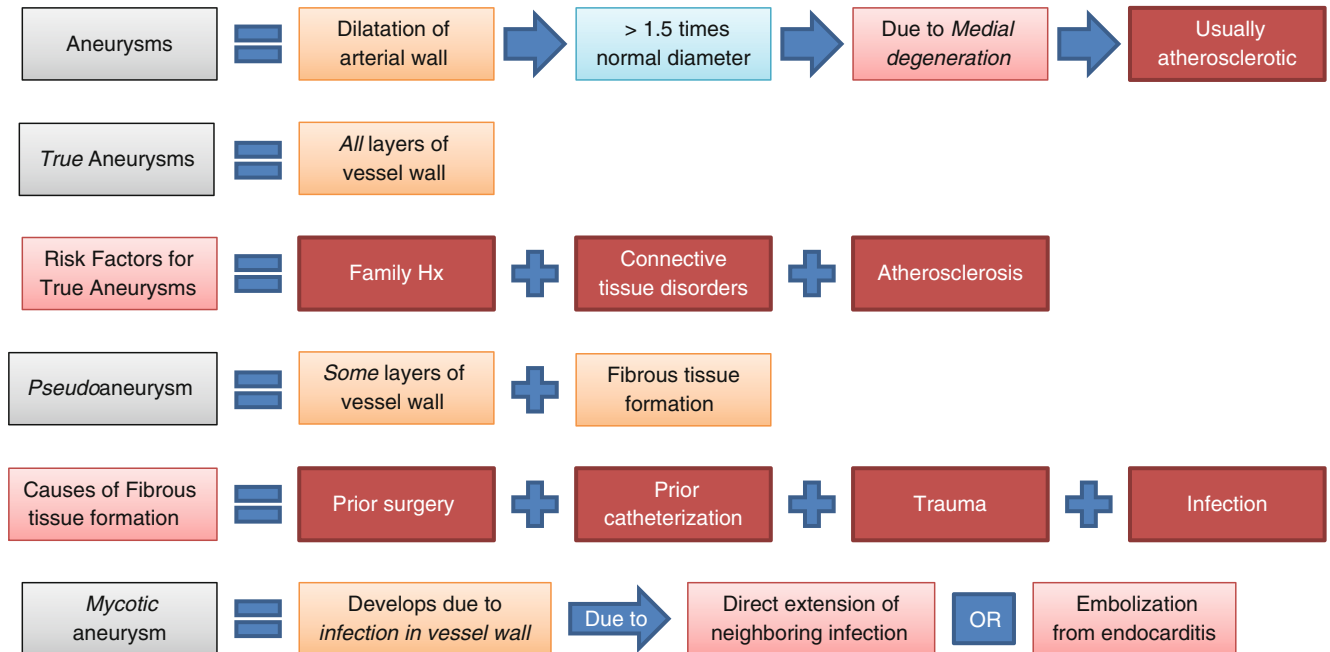


Cardiac Tamponade: Treatment

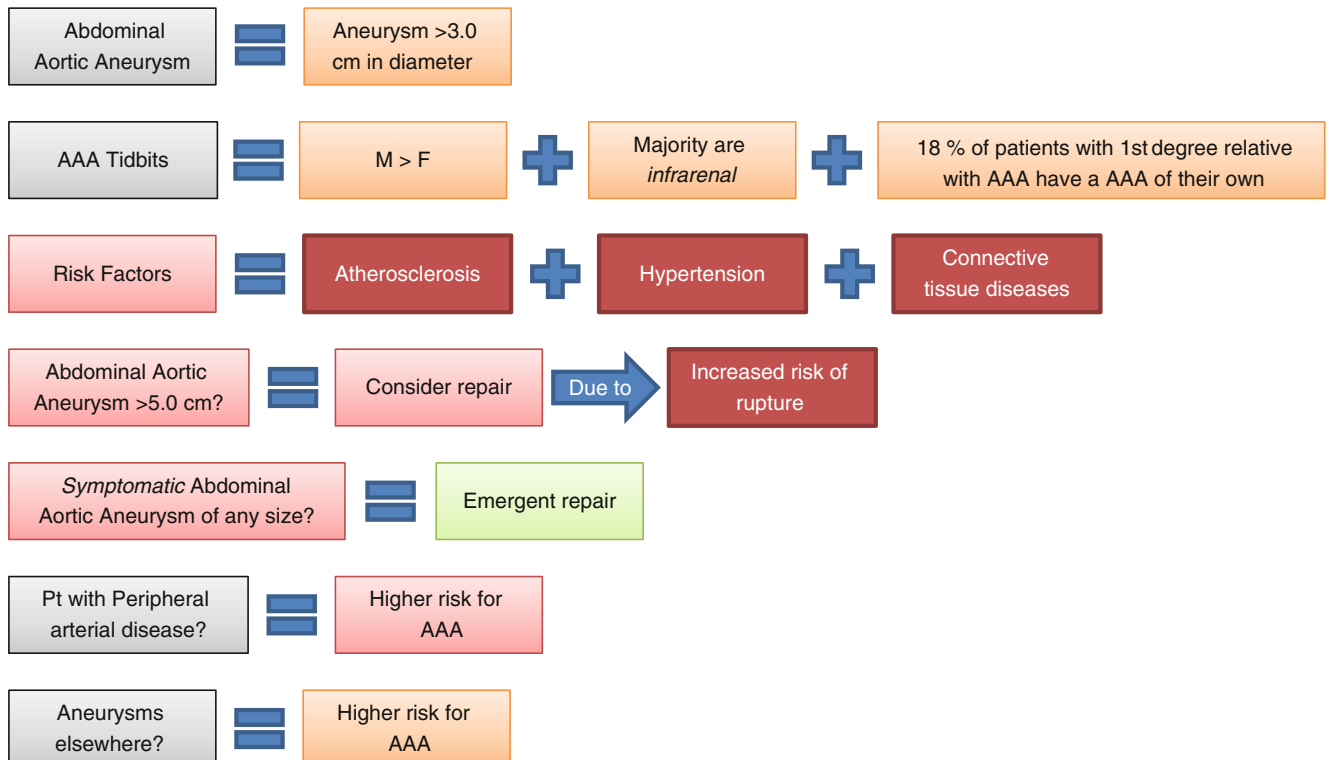


Abdominal Aortic Aneurysm

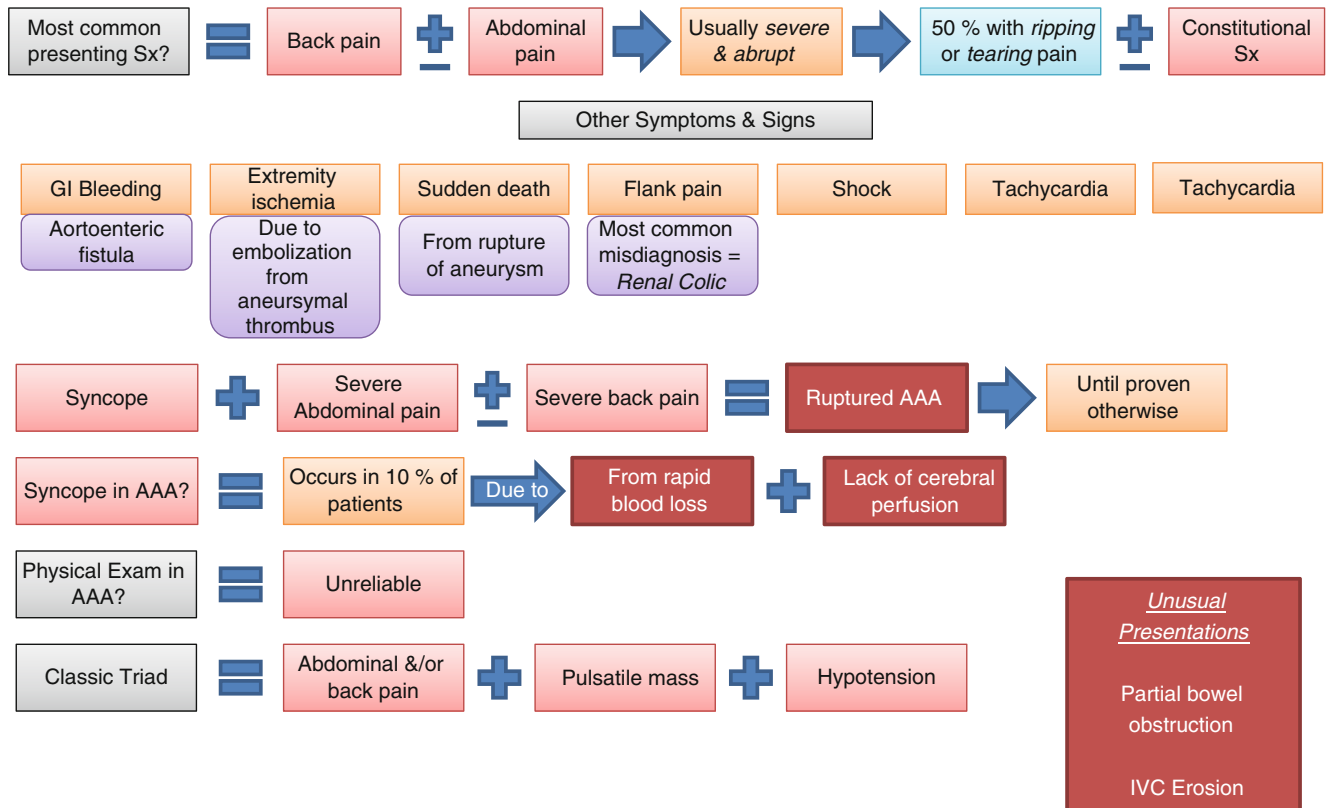
Introduction



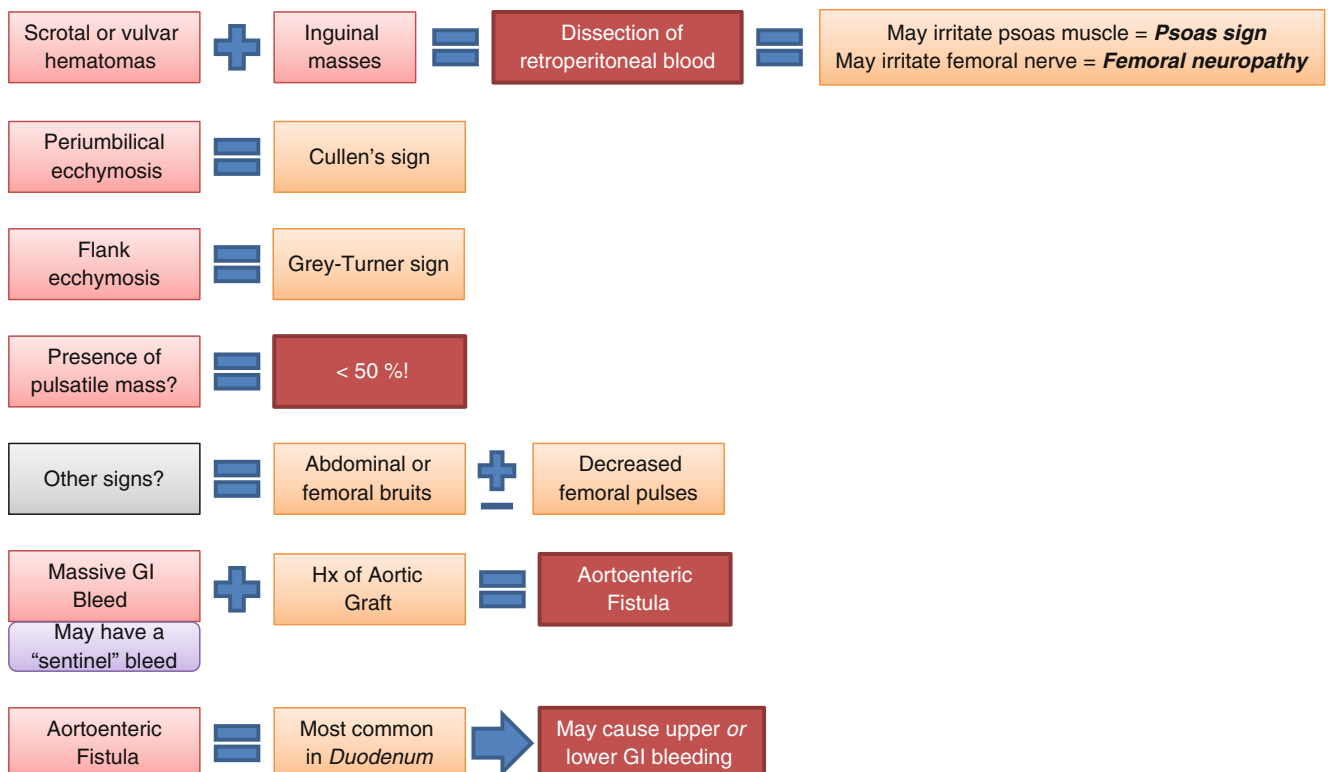
Abdominal Aortic Aneurysm: General



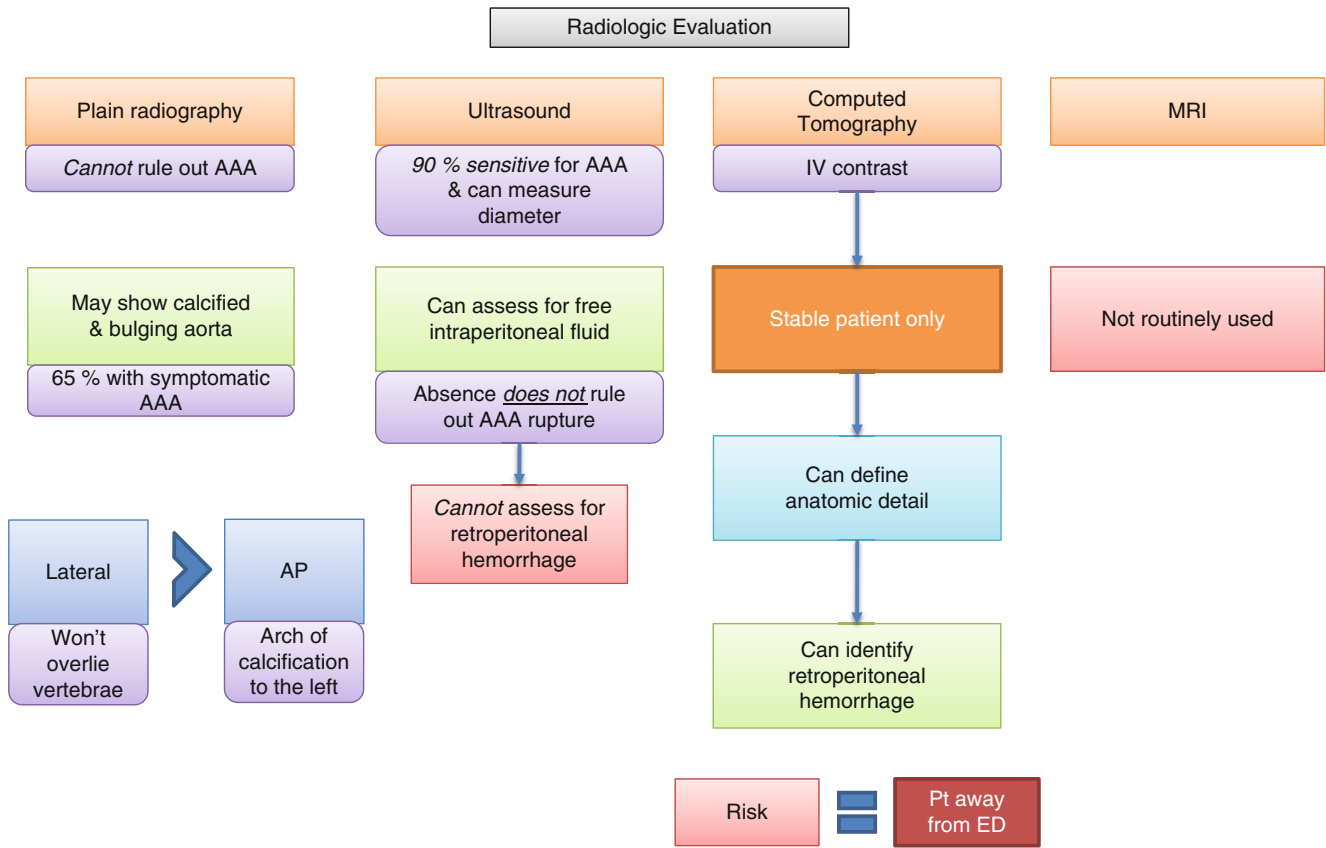
Abdominal Aortic Aneurysm: Symptoms



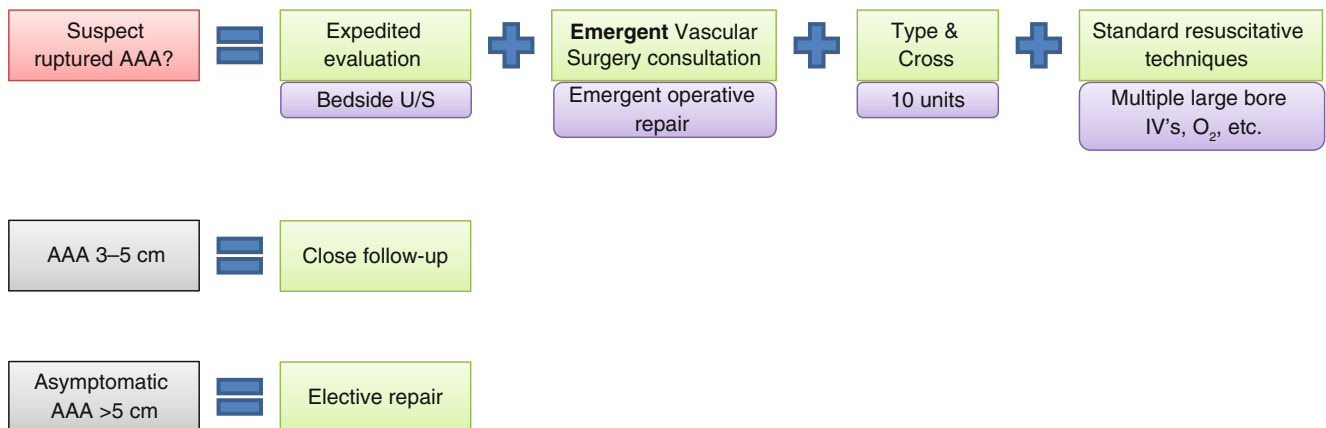
AAA Signs



Diagnosis

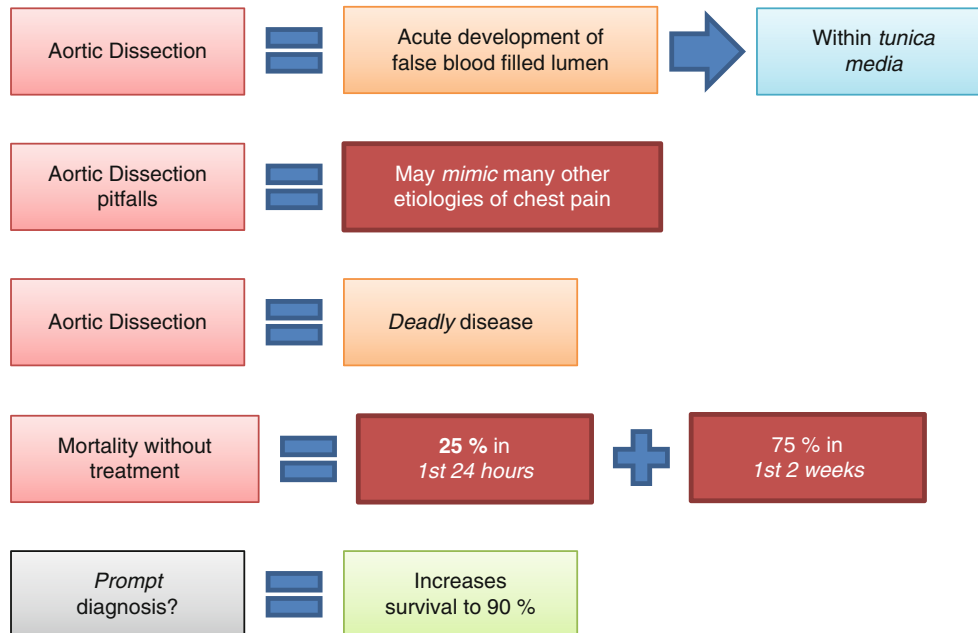


Treatment

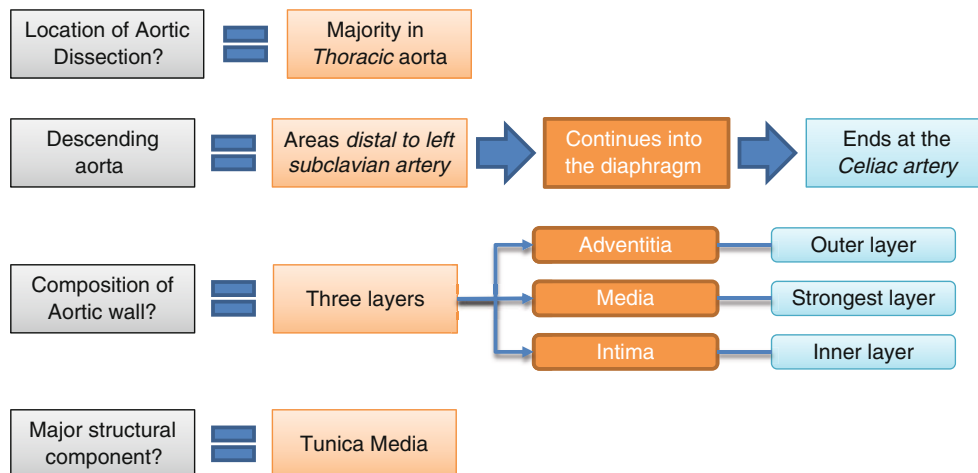


Aortic Dissection

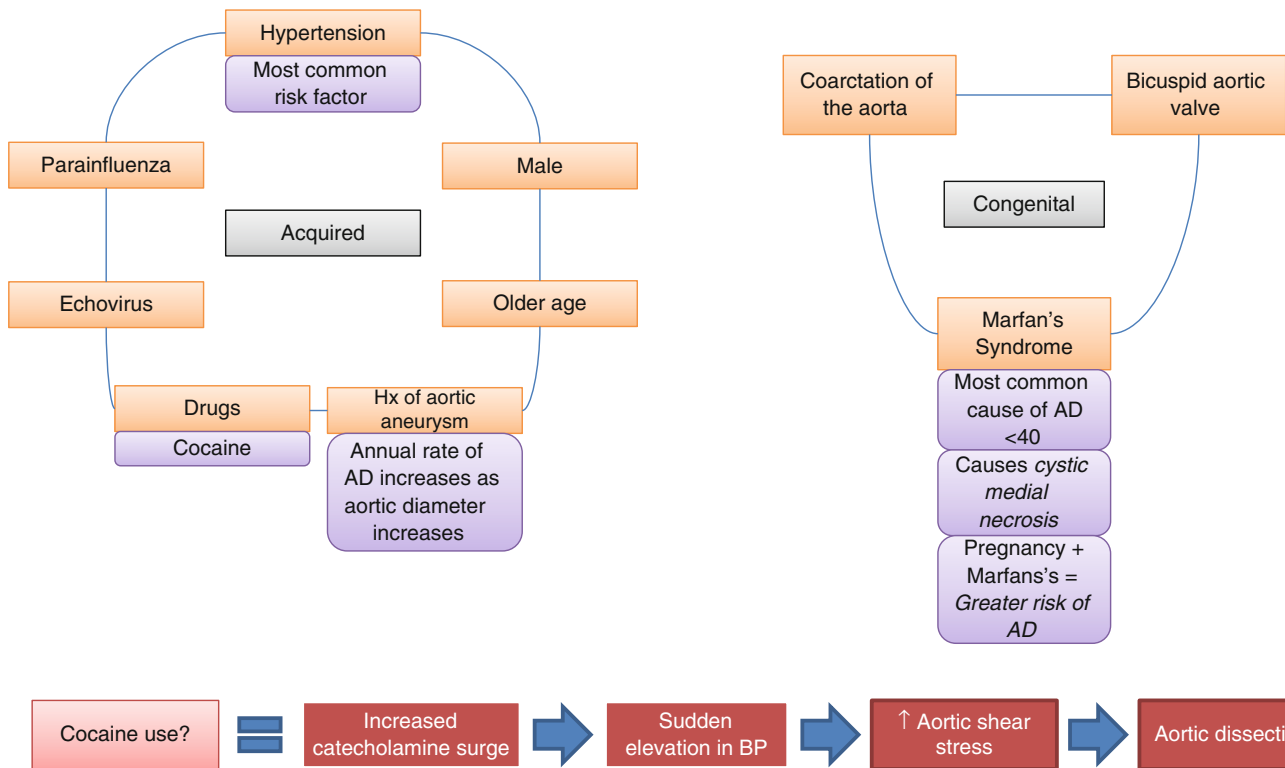
Introduction



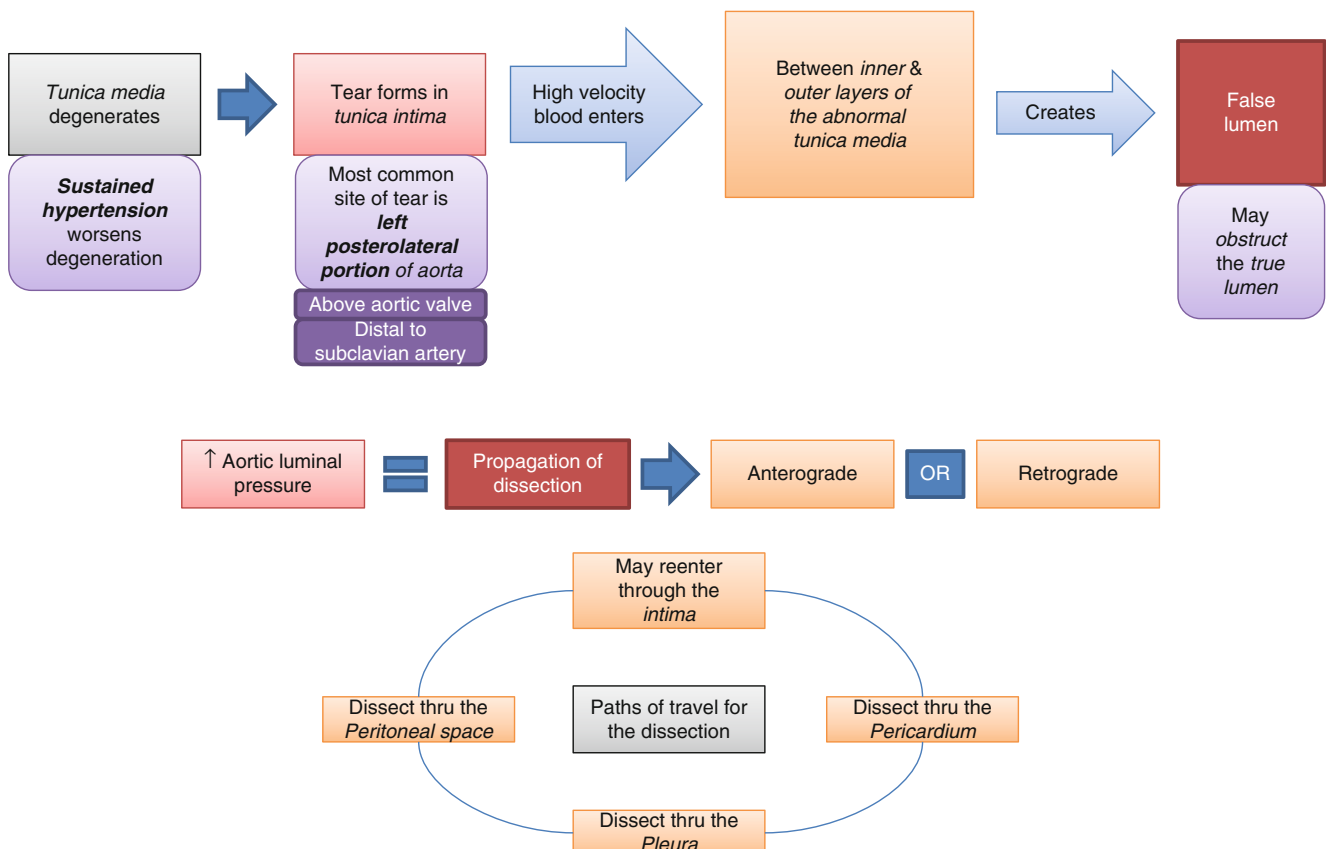
Anatomy



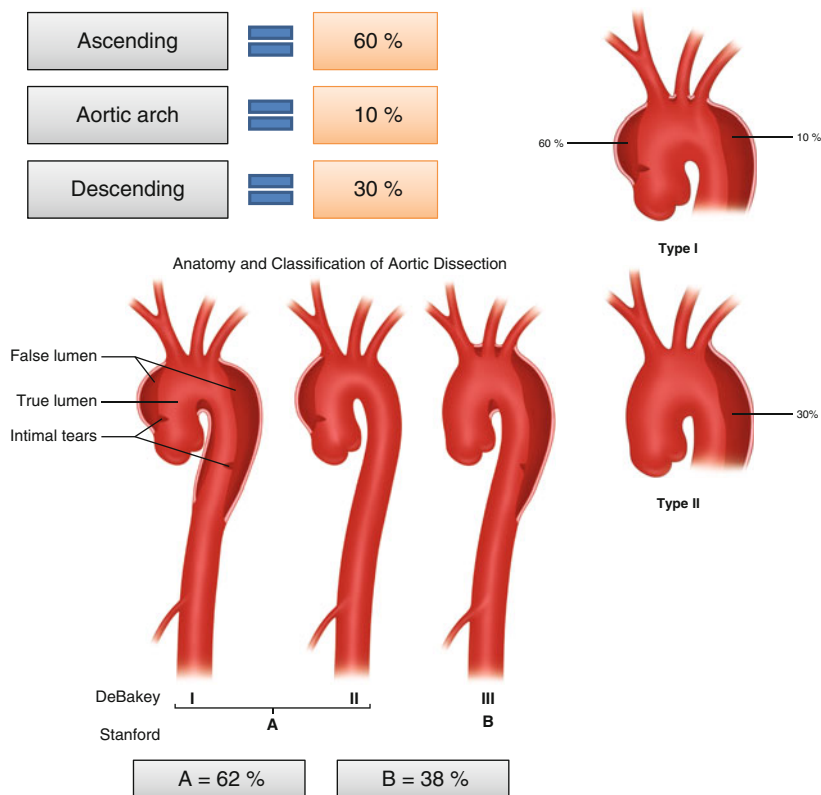
Aortic Dissection Risk Factors



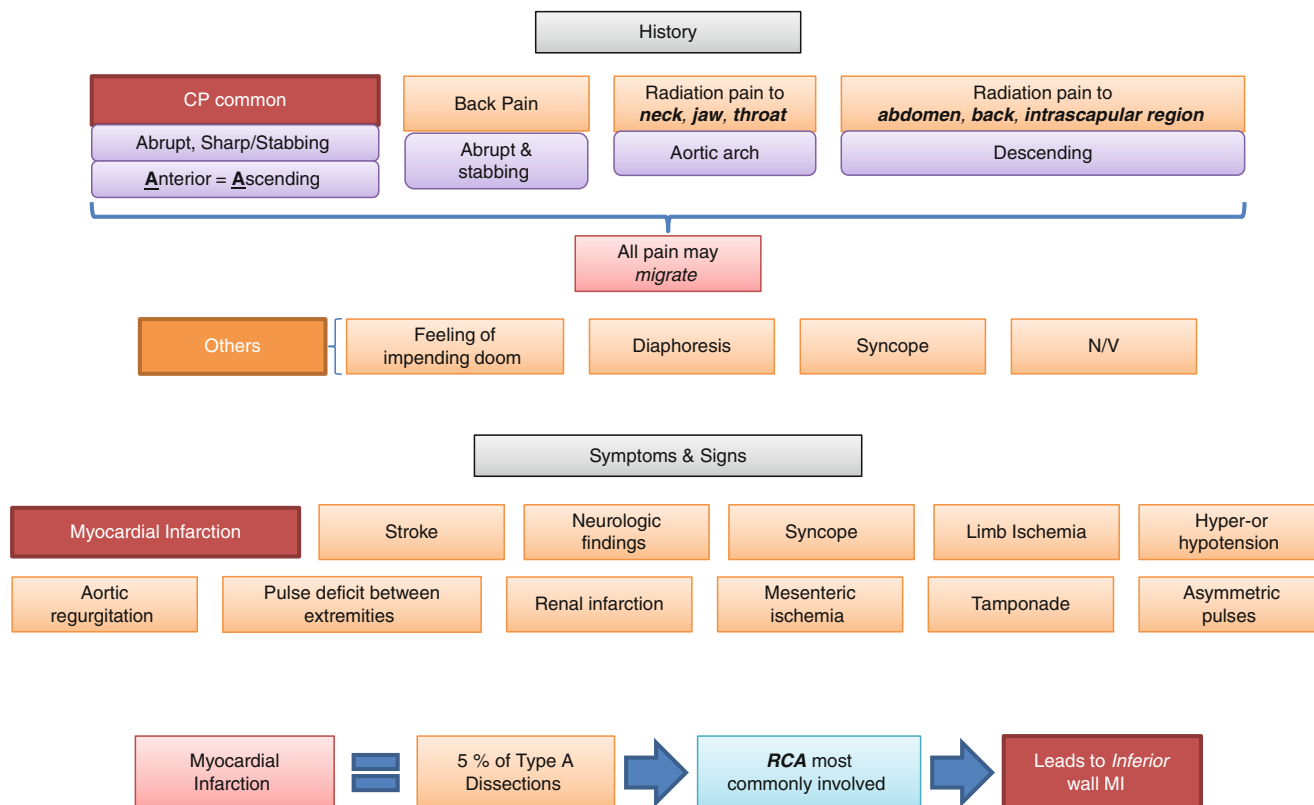
Aortic Dissection Pathophysiology



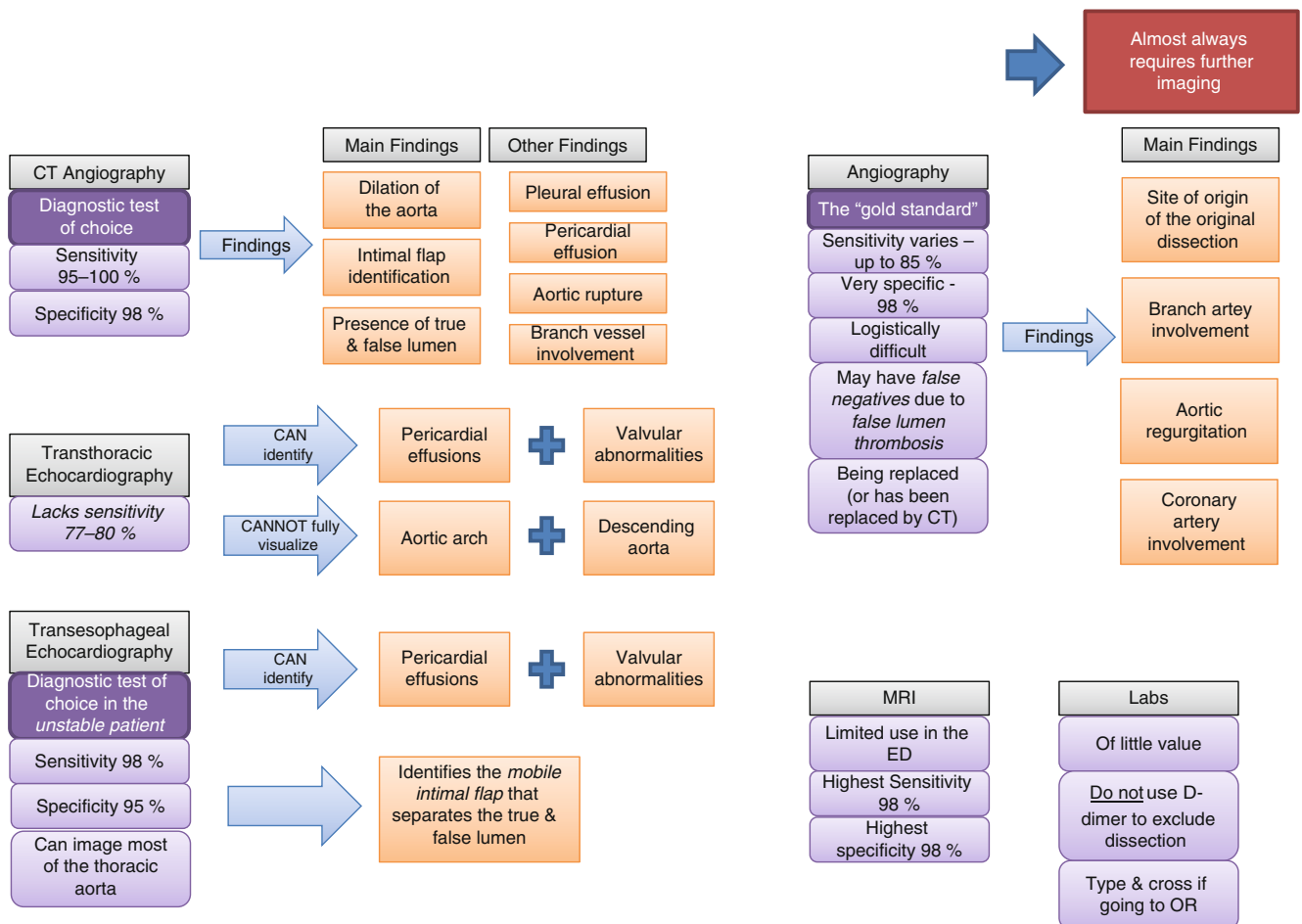
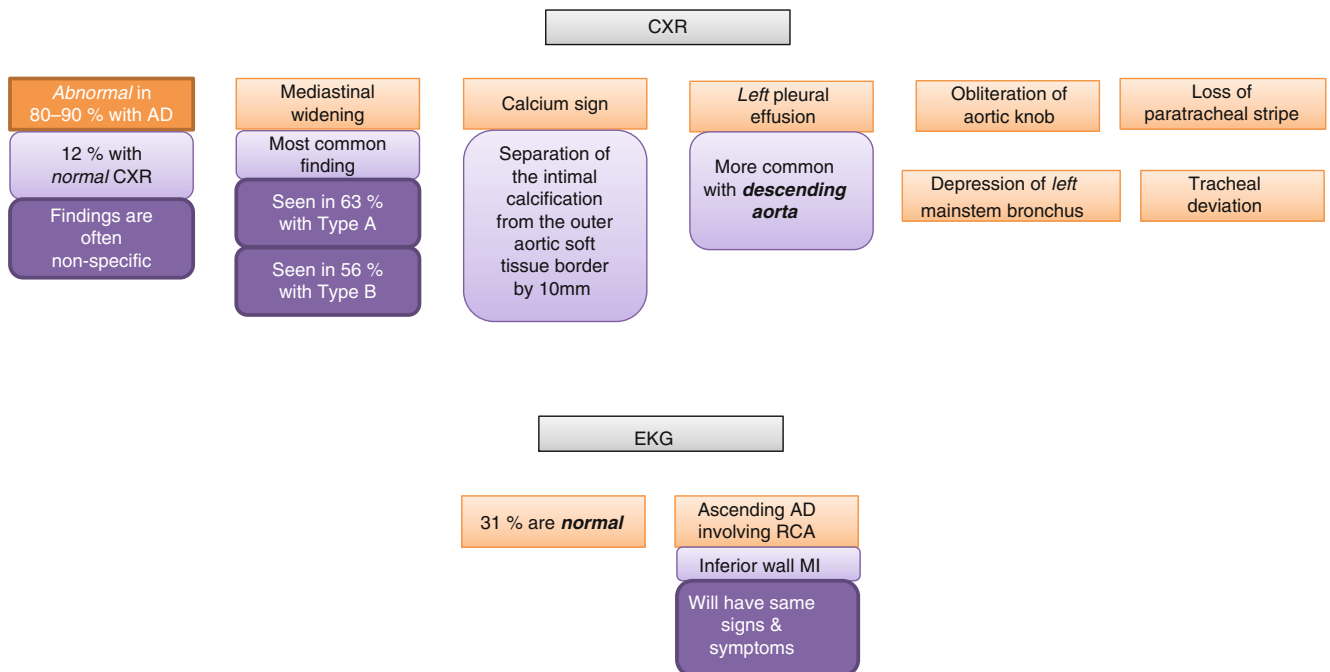
Aortic Dissection Classification



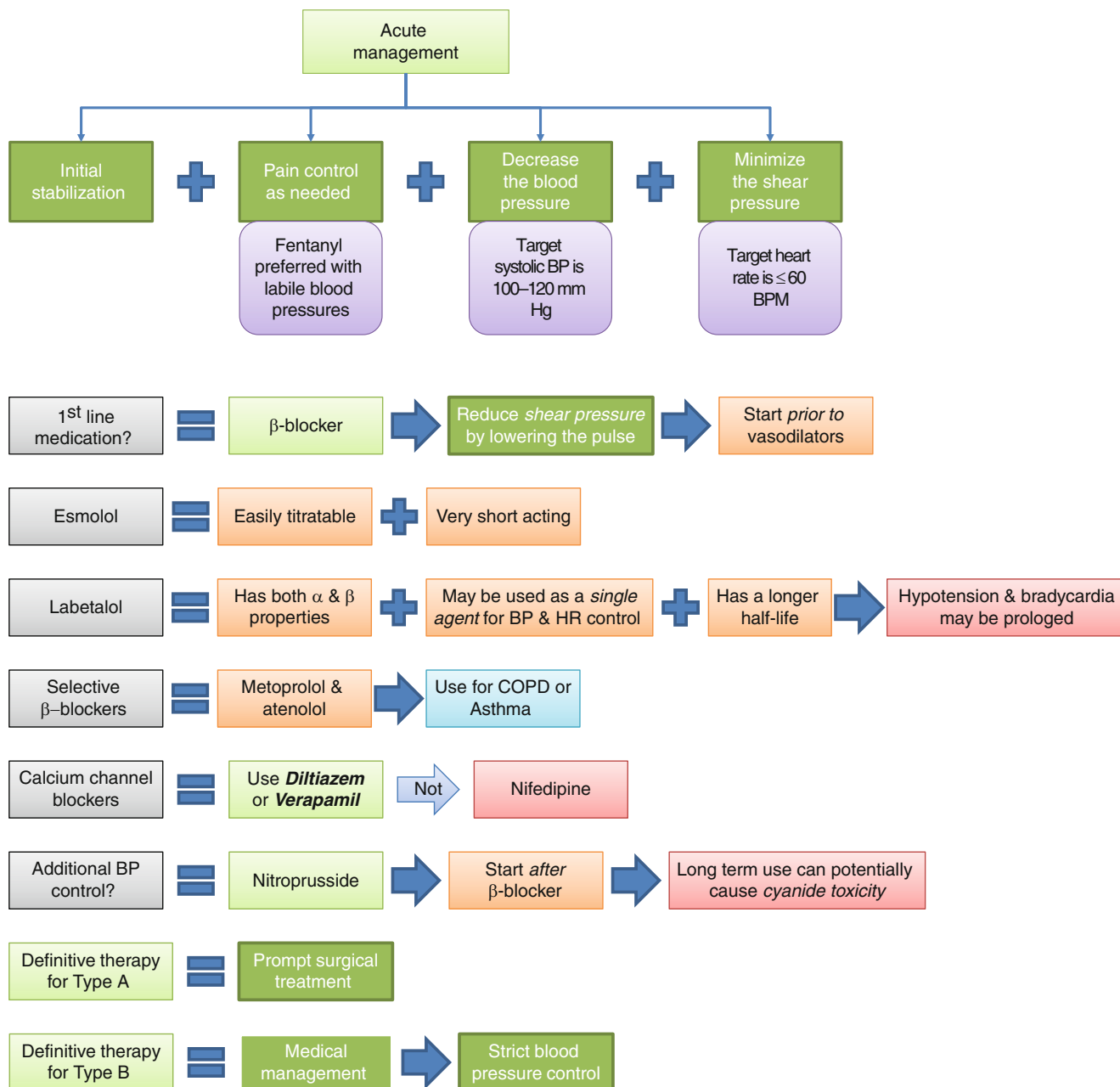
Aortic Dissection: Clinical Features



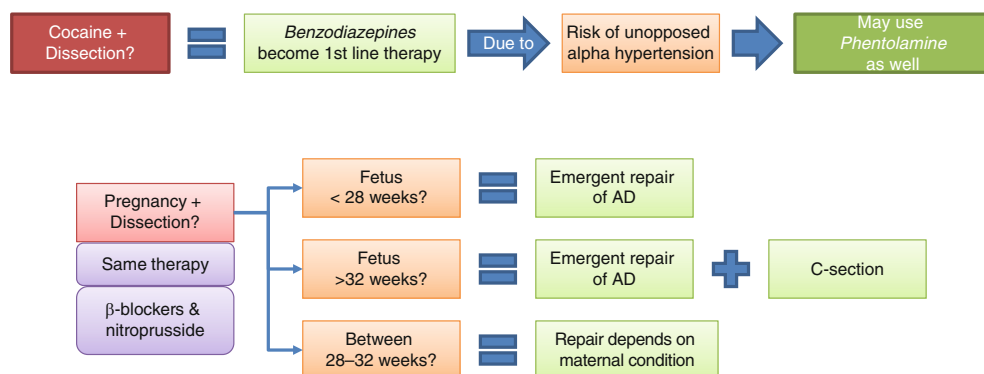
Aortic Dissection Diagnosis



Aortic Dissection Management

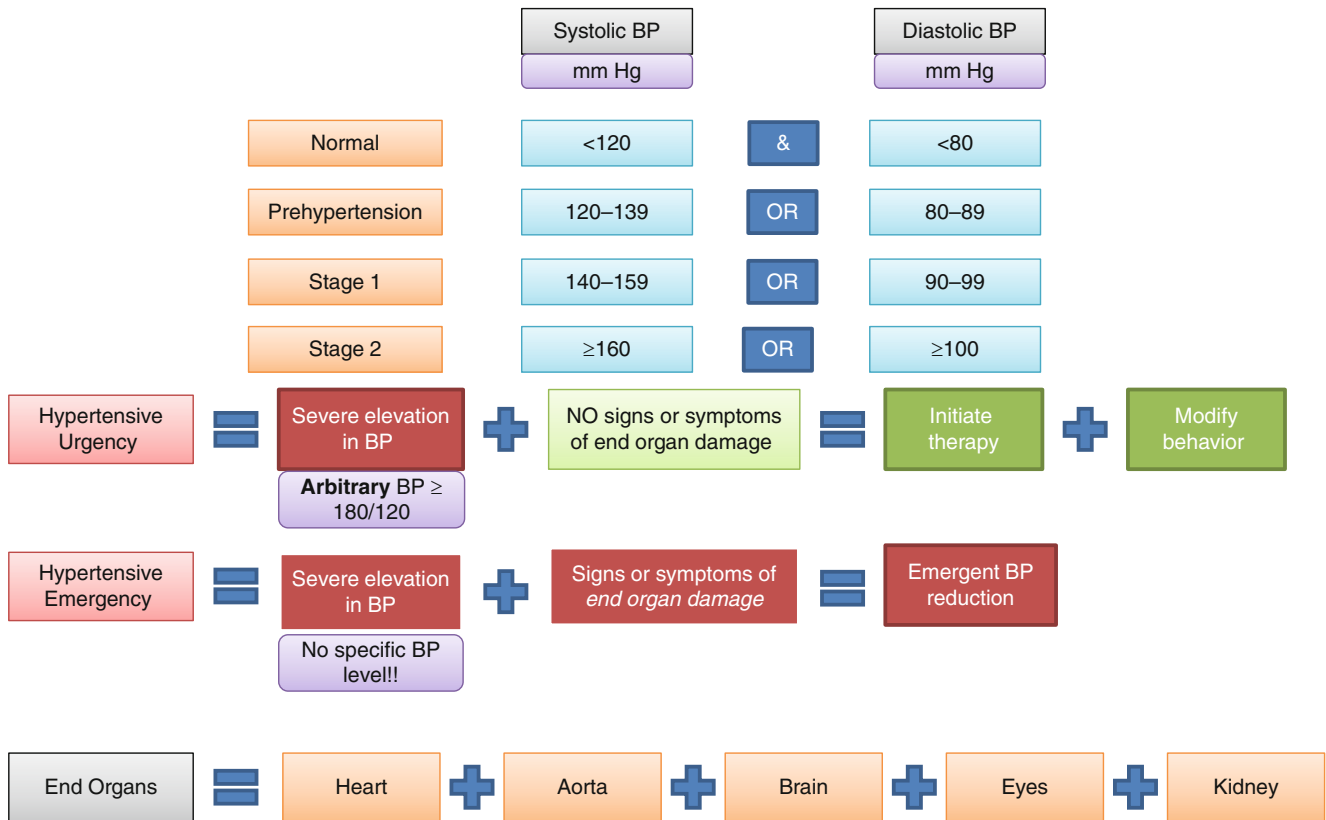


Aortic Dissection Special Circumstance



Hypertension

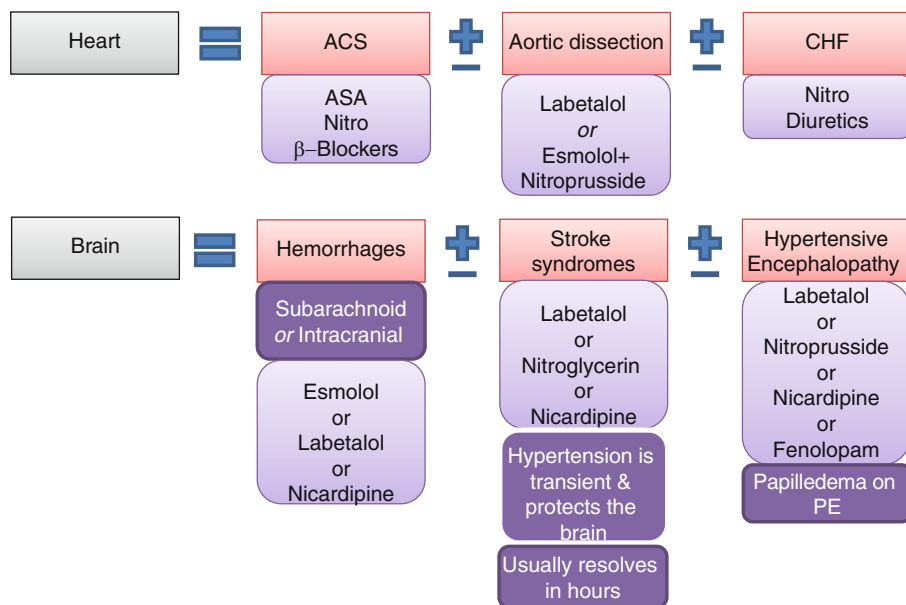
Blood Pressure Definitions



Hypertensive Emergencies



End Organ and Other Syndromes Related to Hypertension



Symptoms & Signs –Hypertensive Encephalopathy

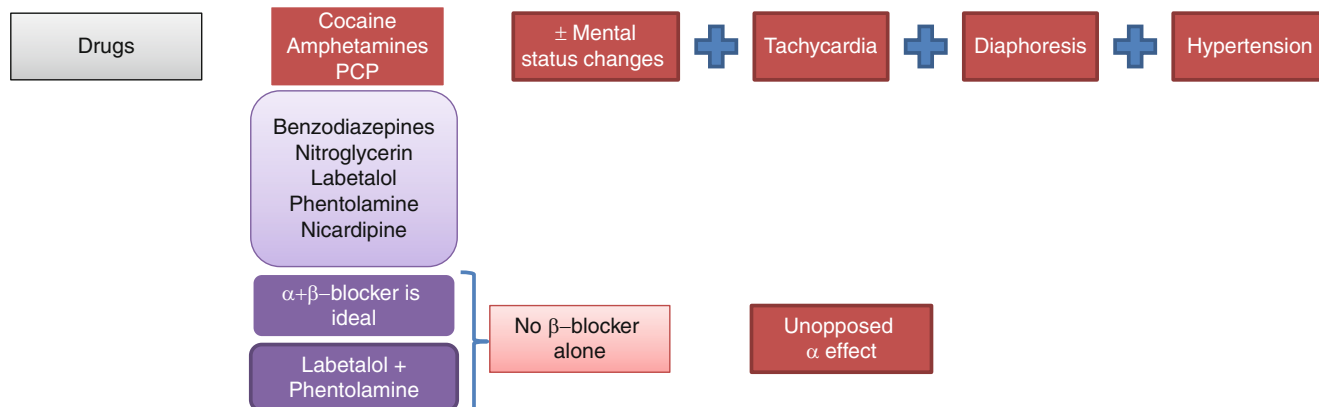
Altered mental status

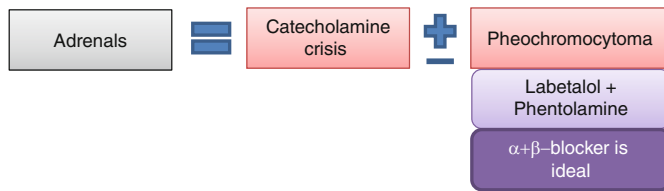
Headache

Vomiting

Seizures

Visual disturbances



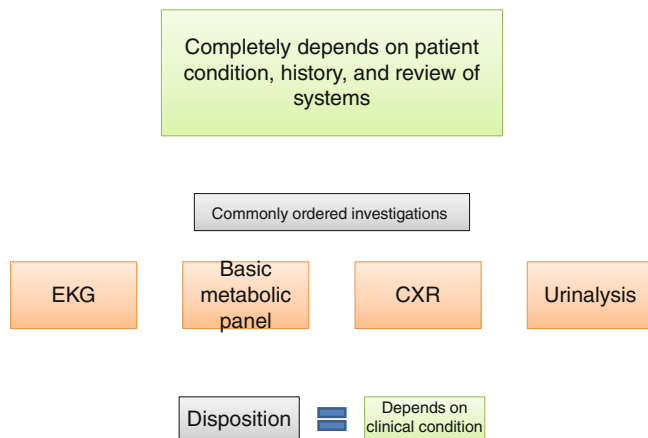


Medication Effects and Side Effects

Medication	Effects	Side Effects & Cautions
Nitroglycerin	Arterial, venous, coronary vasodilator Onset = immediate	Reflex tachycardia Headache
Nitroprusside	Arterial & venous vasodilator Onset = 1-2 min	<u>Reflex tachycardia</u> Use with β-blocker ↑ Increased ICP <u>Long term use</u> Cyanide toxicity
Labetalol	α+β-blocker Onset = 2-5 min	No reflex tachycardia Do not use in <i>AV blocks, CHF, or bronchospasm</i>
Esmolol	β-blocker Onset = immediate	Do not use in <i>bradycardia, CHF, bronchospasm</i>

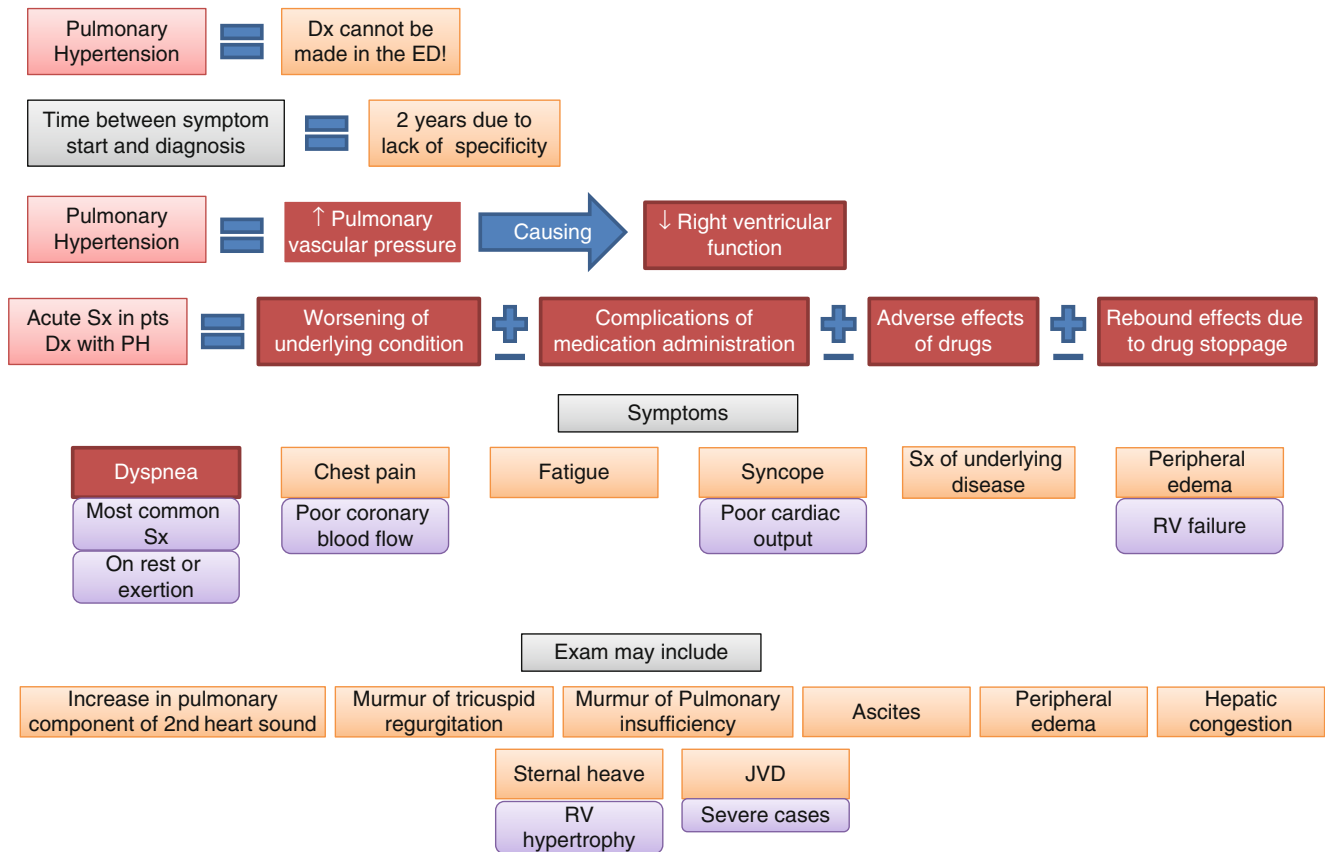
Medication	Effects	Side Effects & Cautions
Nicardipine	Selective for <i>cerebral & coronary</i> arteries Onset = 5–10 min	Do not use in <i>CHF</i>
Phentolamine	α_1 & α_2 blocker Onset = 5–10 min	Cerebrovascular occlusion MI
Enalaprilat	ACE Inhibitor Onset = 5–10 min	Avoid in <i>pregnancy</i> Dizziness Headache
Hydralazine	Arteriolar vasodilator May be used in Pediatric nephritis Not recommended Pregnancy-induced hypertension Onset = 10 min	Reflex tachycardia Chronic use = “Lupus-like” syndrome

Evaluation of Severe Asymptomatic Hypertension

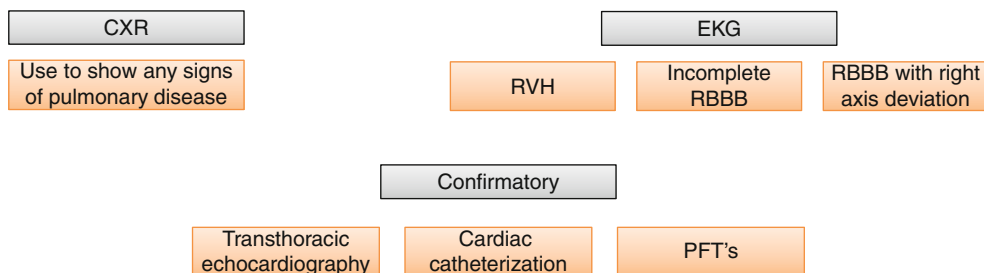


Pulmonary Hypertension

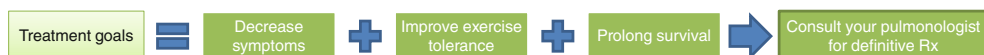
Introduction



Diagnostic Studies

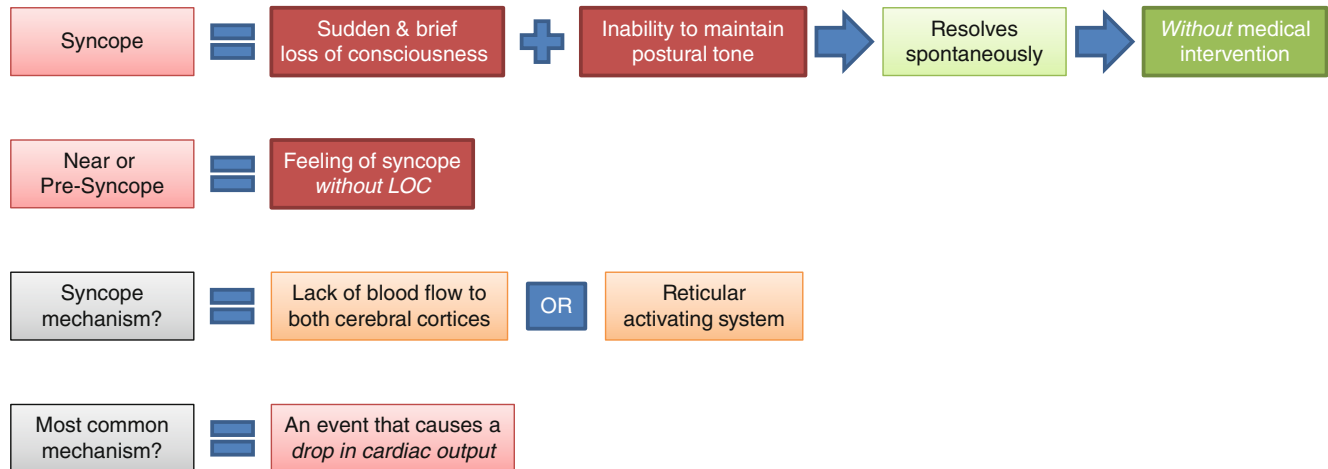


Goal of Treatment

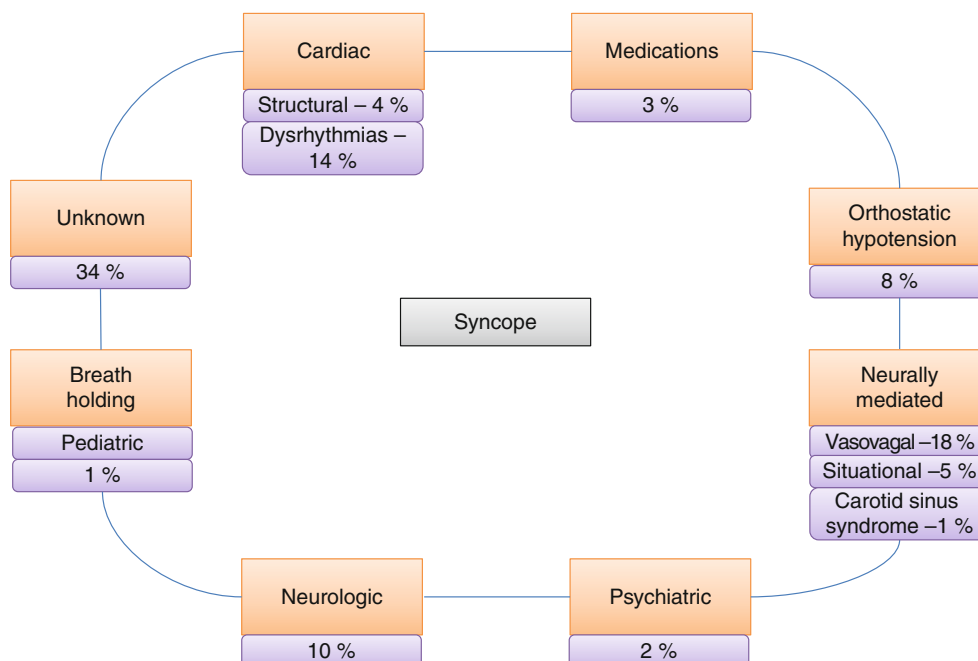


Syncope

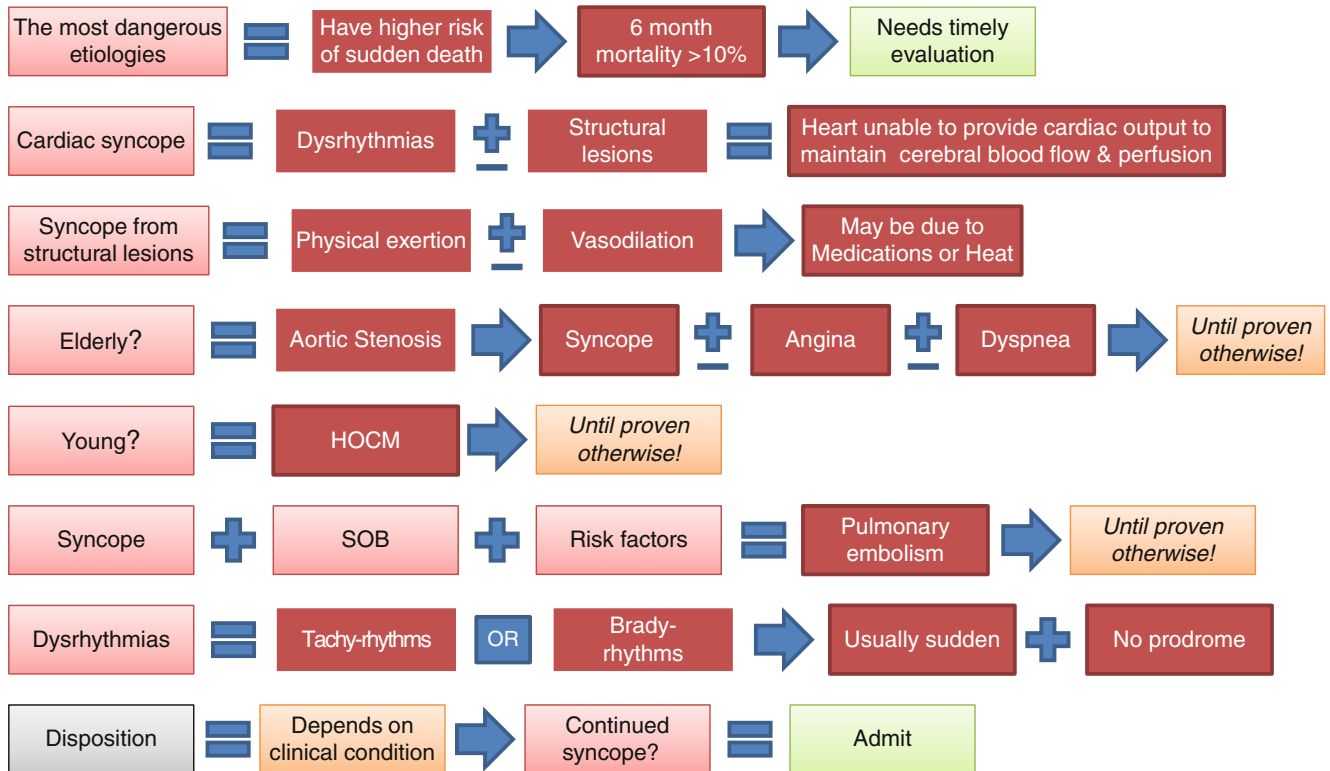
Introduction



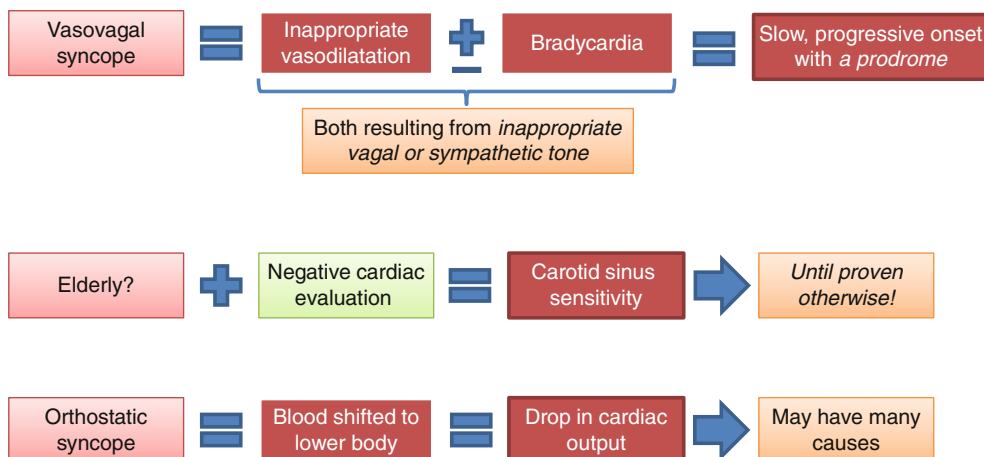
Causes of Syncope



Cardiac Syncope



Vasovagal and Orthostatic Syncope



Evaluation of Syncope

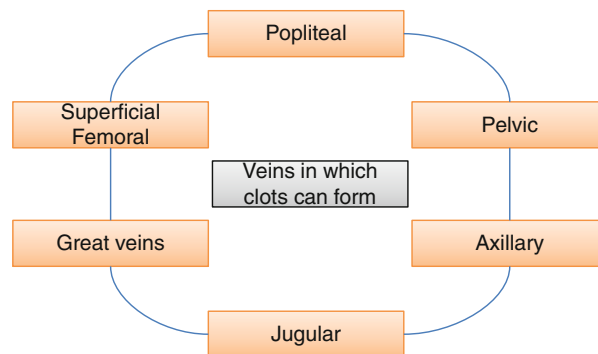
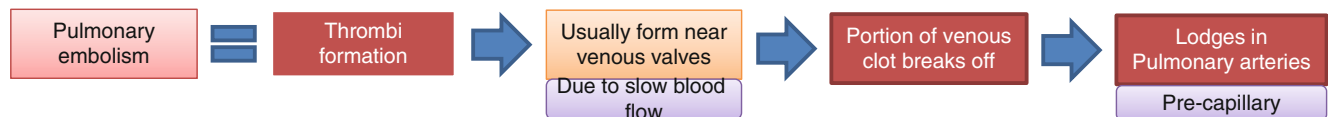
Completely depends on patient condition, history, and review of systems

Disposition

Depends on clinical condition

Deep Venous Thrombosis and Pulmonary Embolism

Introduction



PE symptoms

Pulmonary vessels
20–30 % occluded

Obstruction of pulmonary blood flow

↑ Ventilation
↓ Perfusion

Alveolar dead space

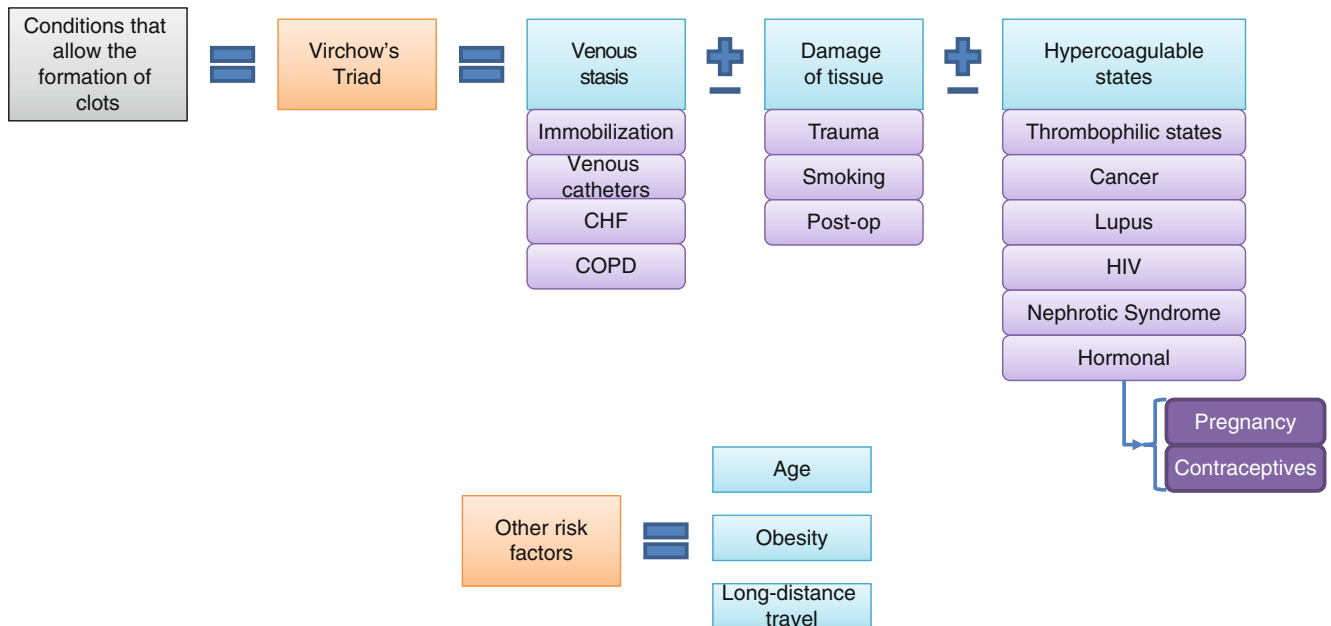
Hypoxemia in PE?

Unpredictable

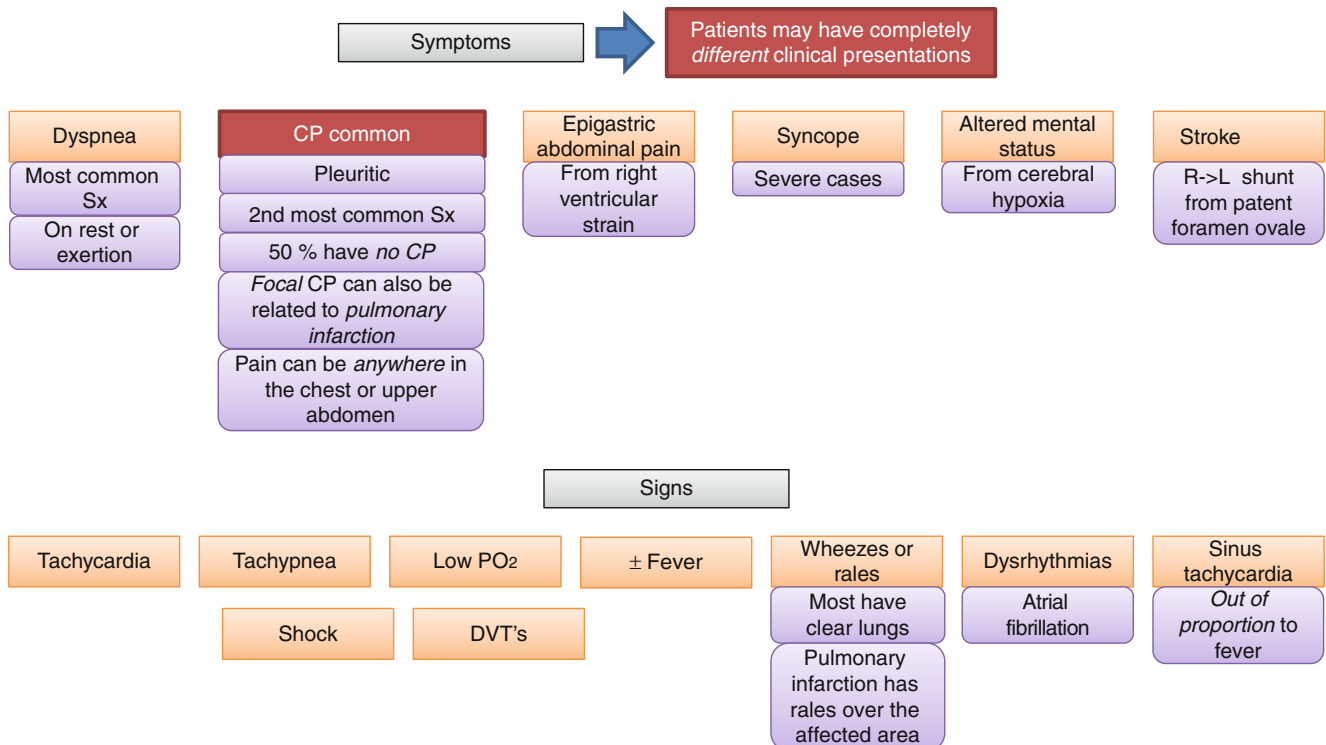
Due to

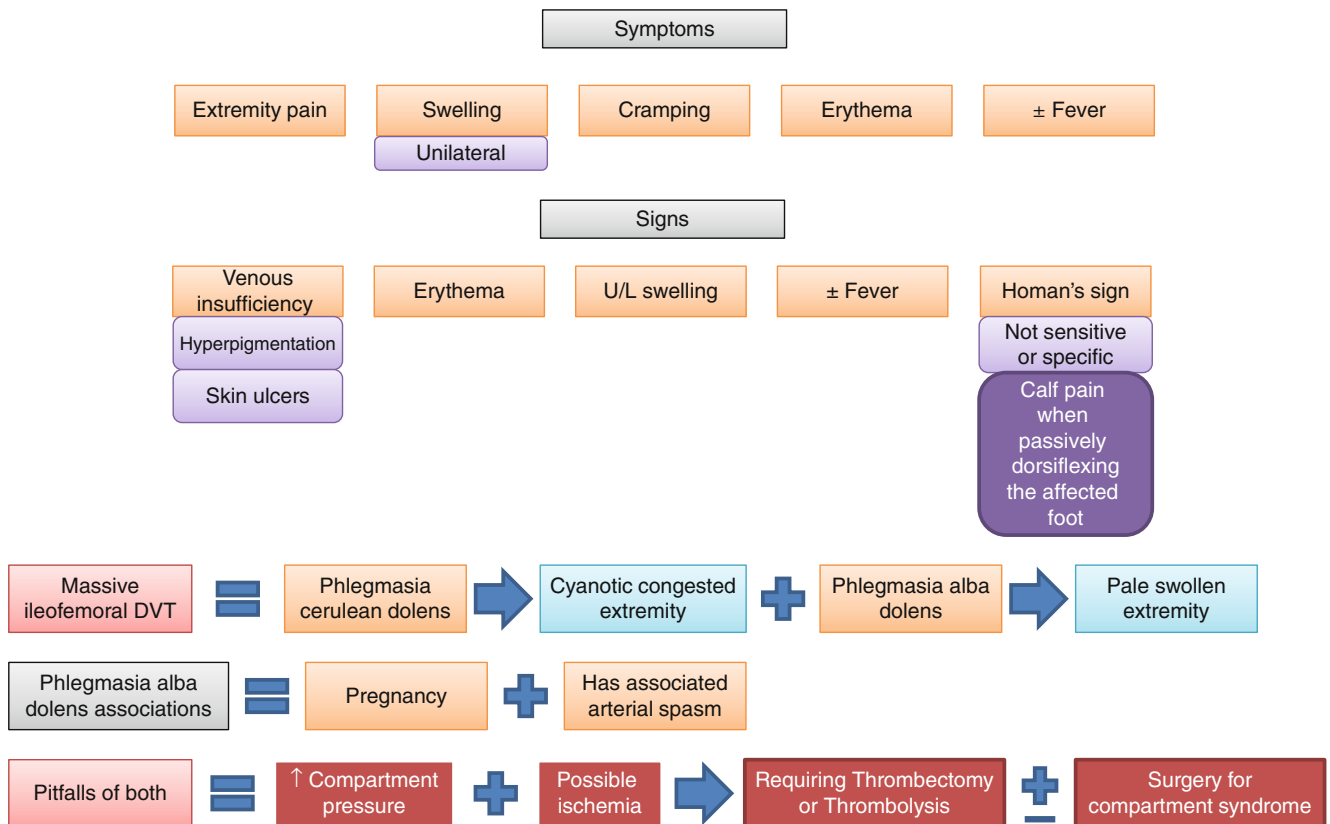
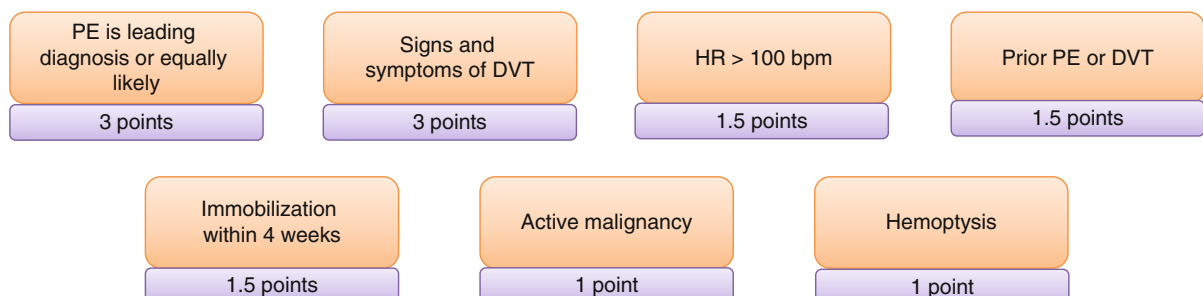
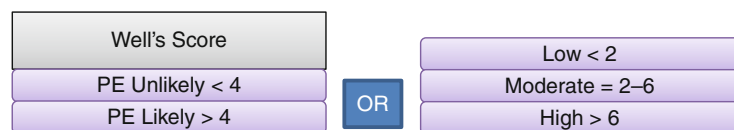
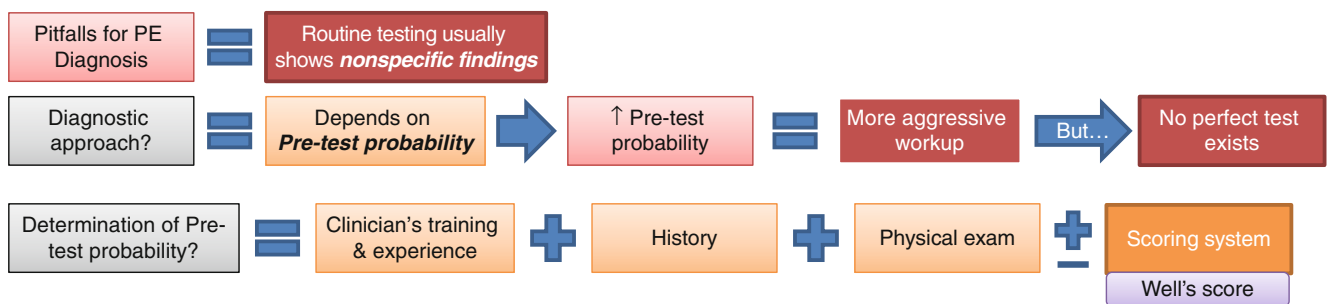
Shunting of blood flow

Risk Factors for Thromboembolism

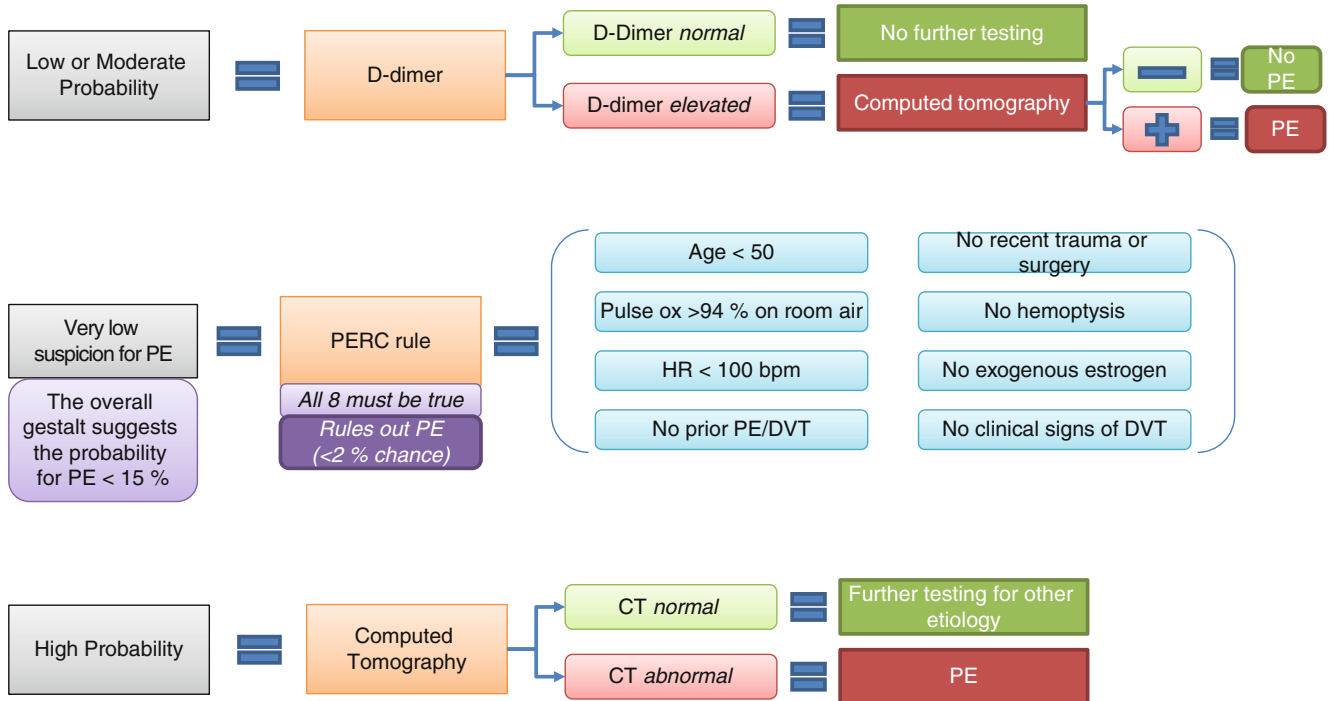


PE: Clinical Features

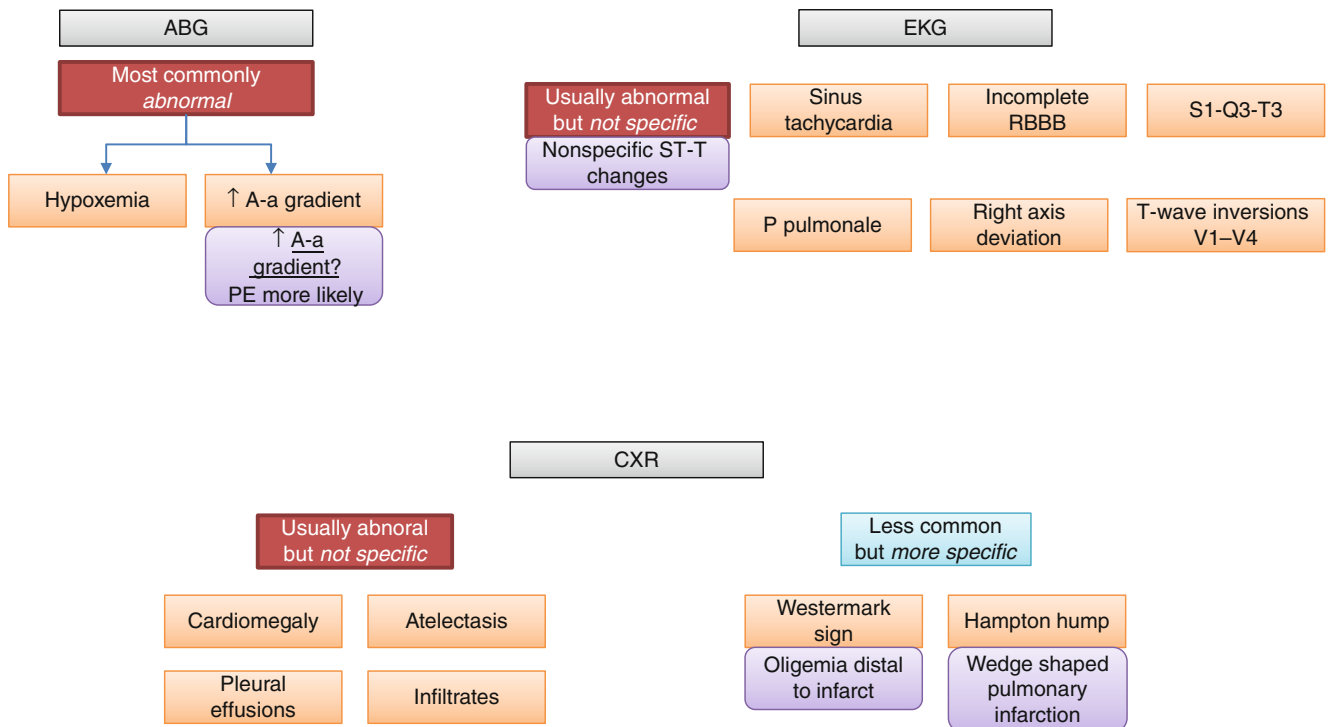


DVT: Clinical Features**Diagnosis**

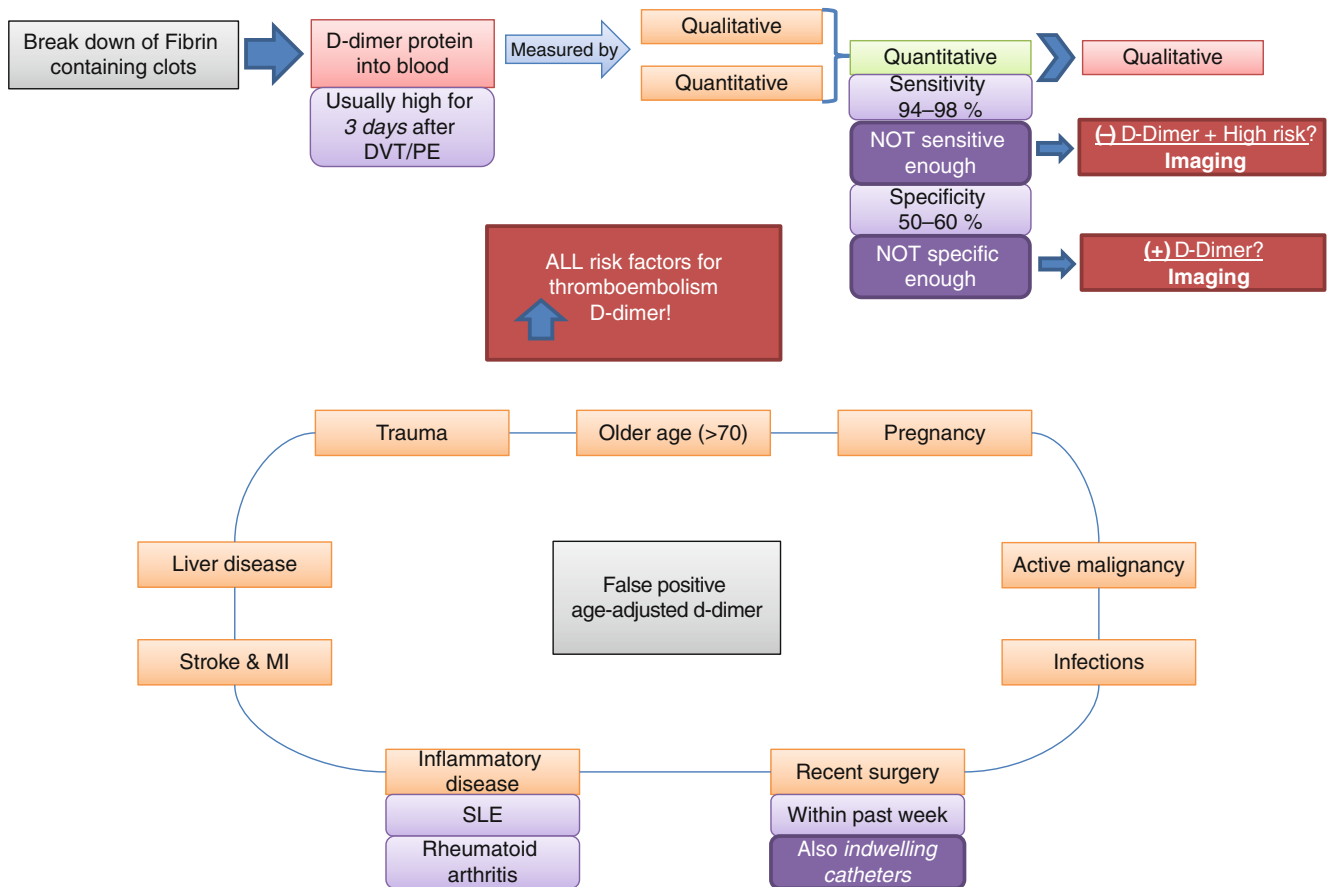
Using Pretest Probability in the Diagnosis of PE



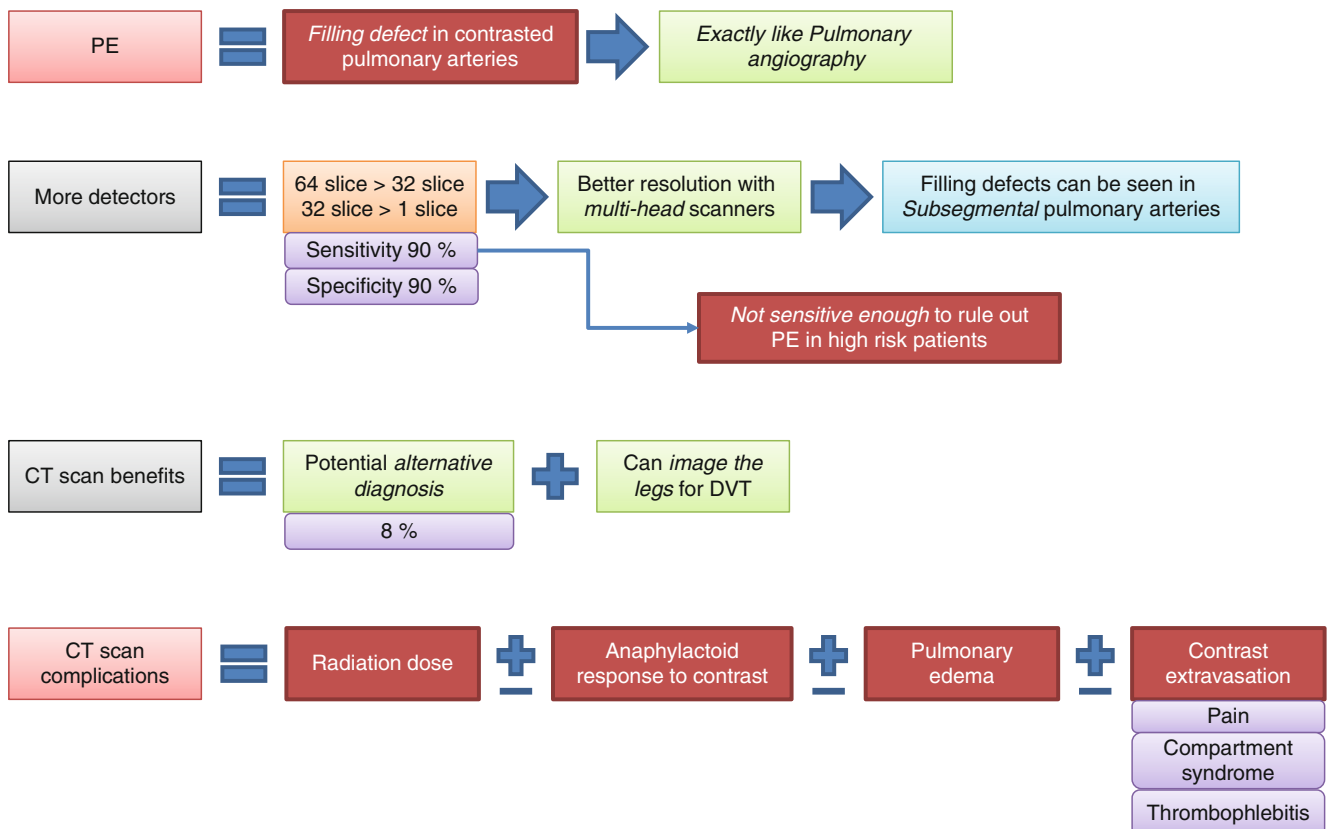
Other Basic Tests



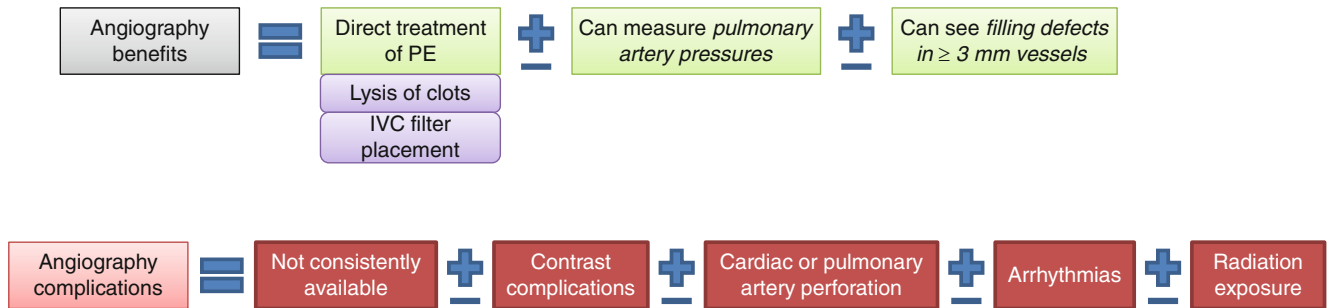
D-Dimer



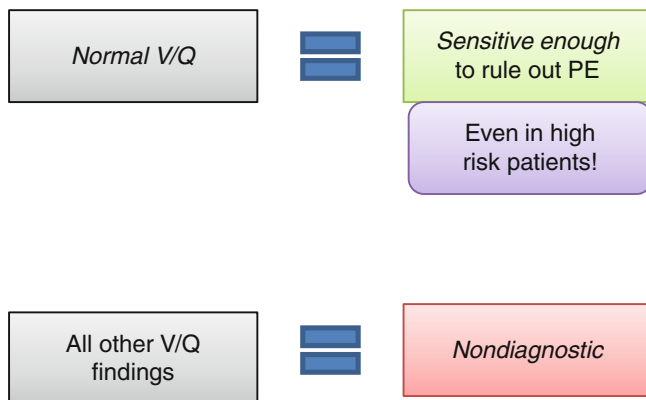
PE Imaging: CT Angiography



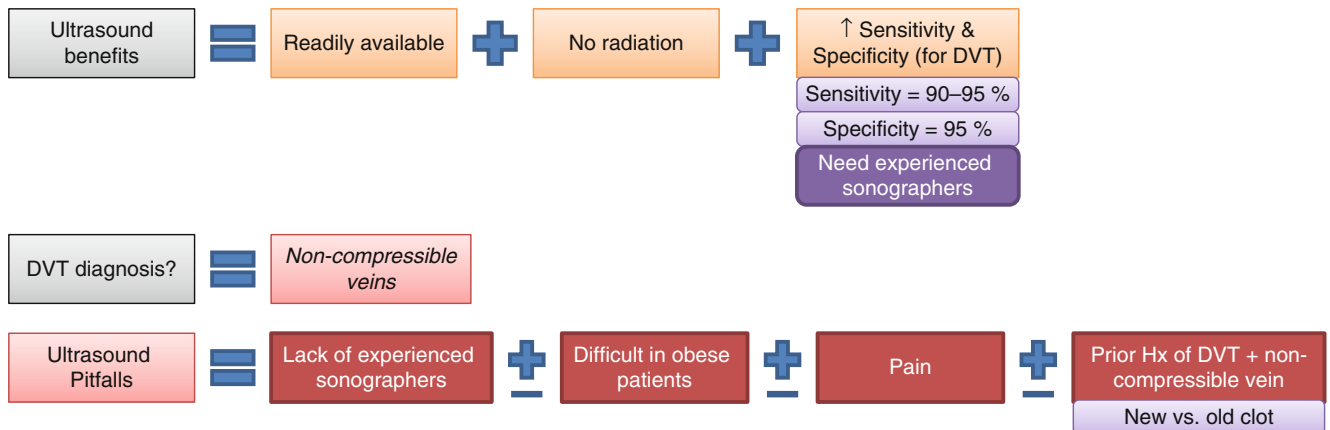
PE Imaging: Pulmonary Angiography



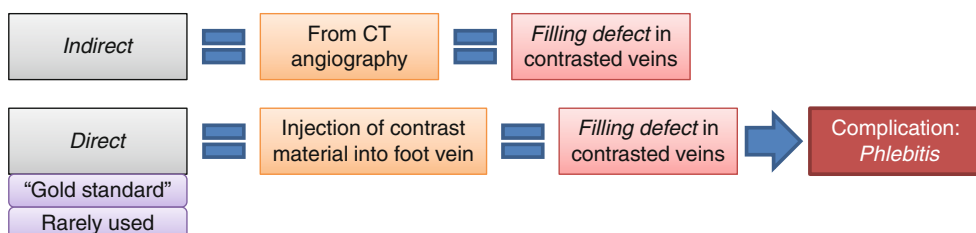
PE Imaging: VQ Scanning



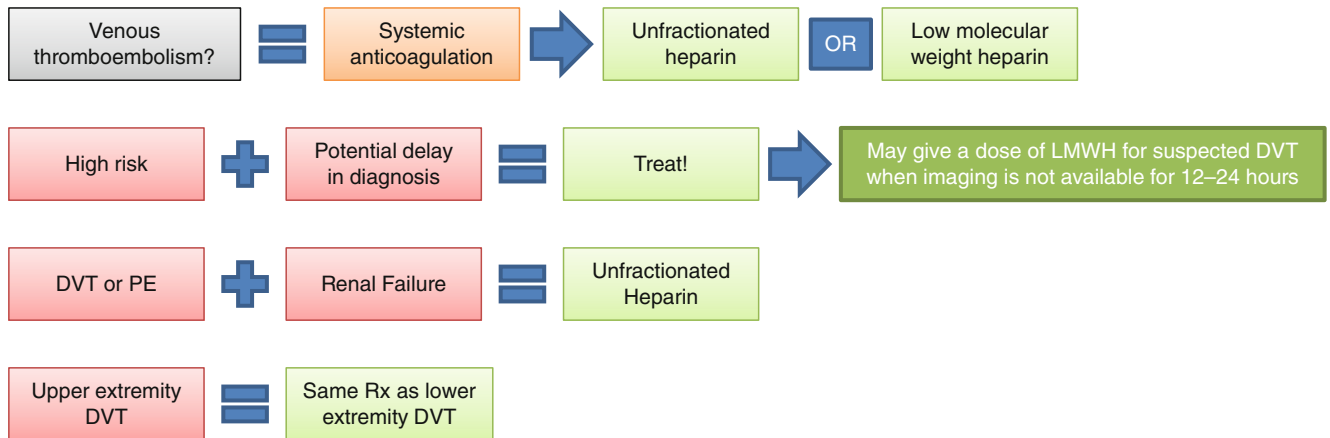
Venous Ultrasound



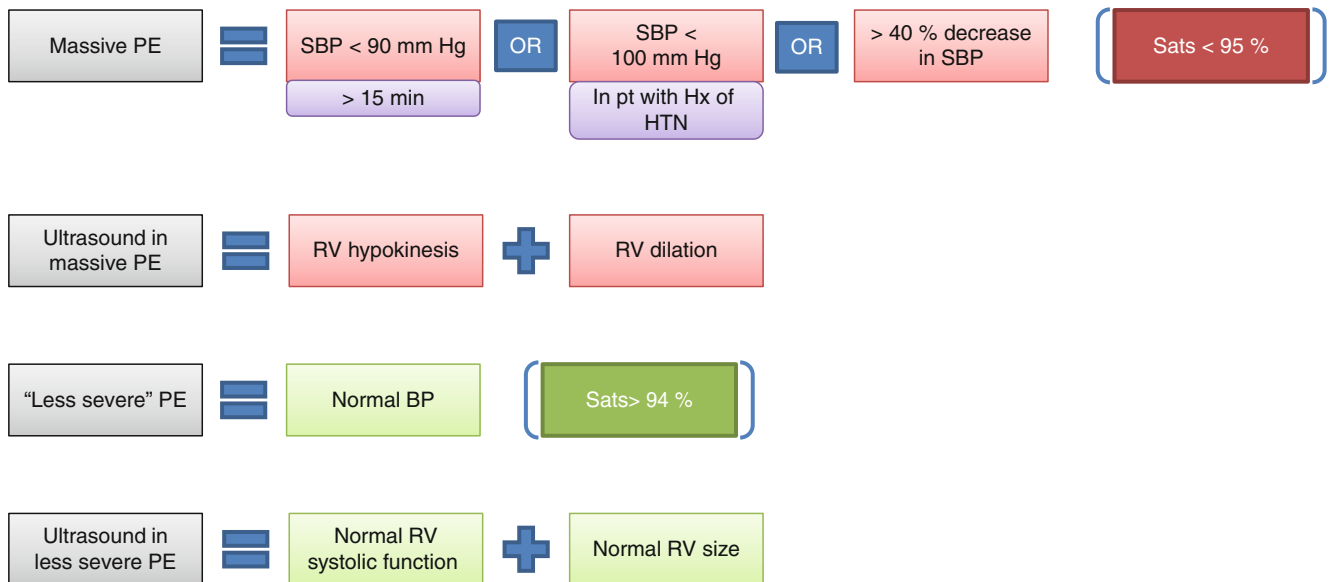
Venography



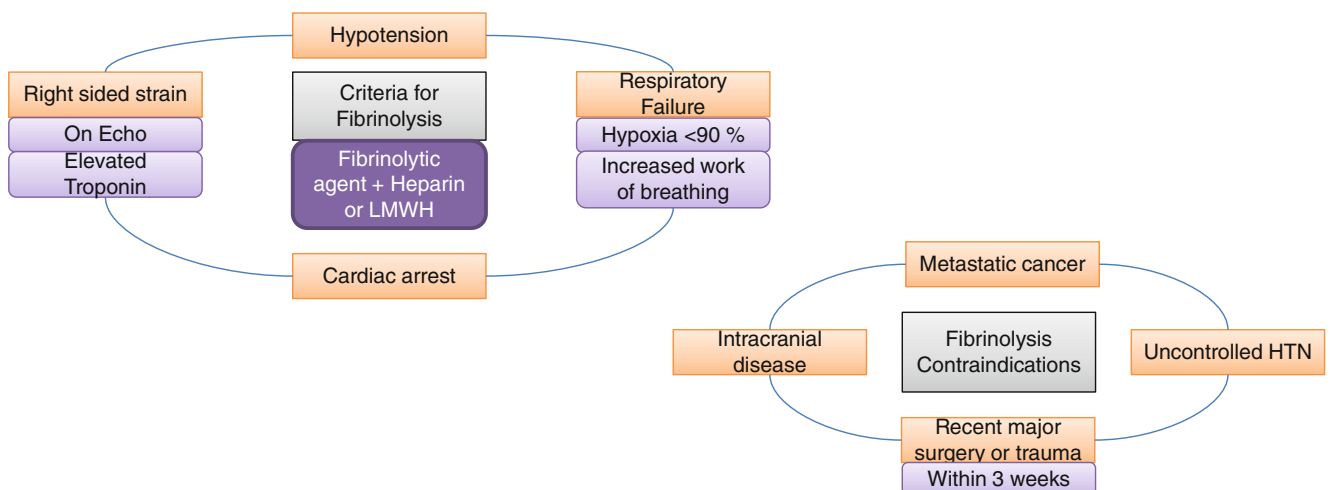
Treatment: Anticoagulation



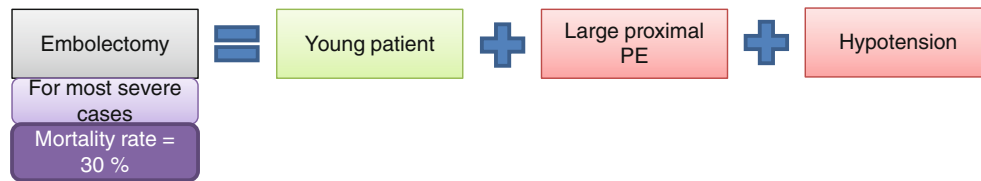
PE Tidbits



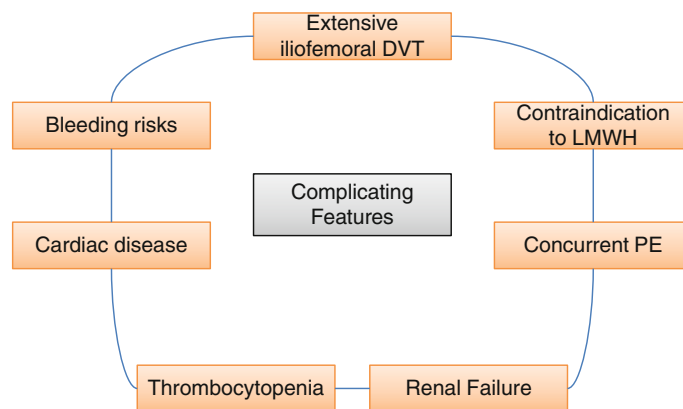
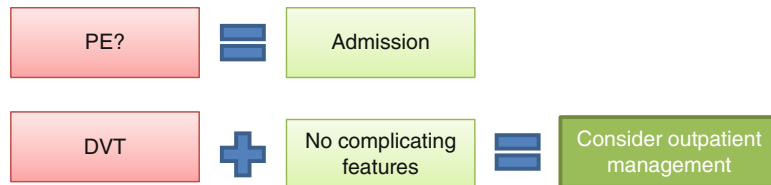
Treatment: Fibrinolysis



Treatment: Embolectomy

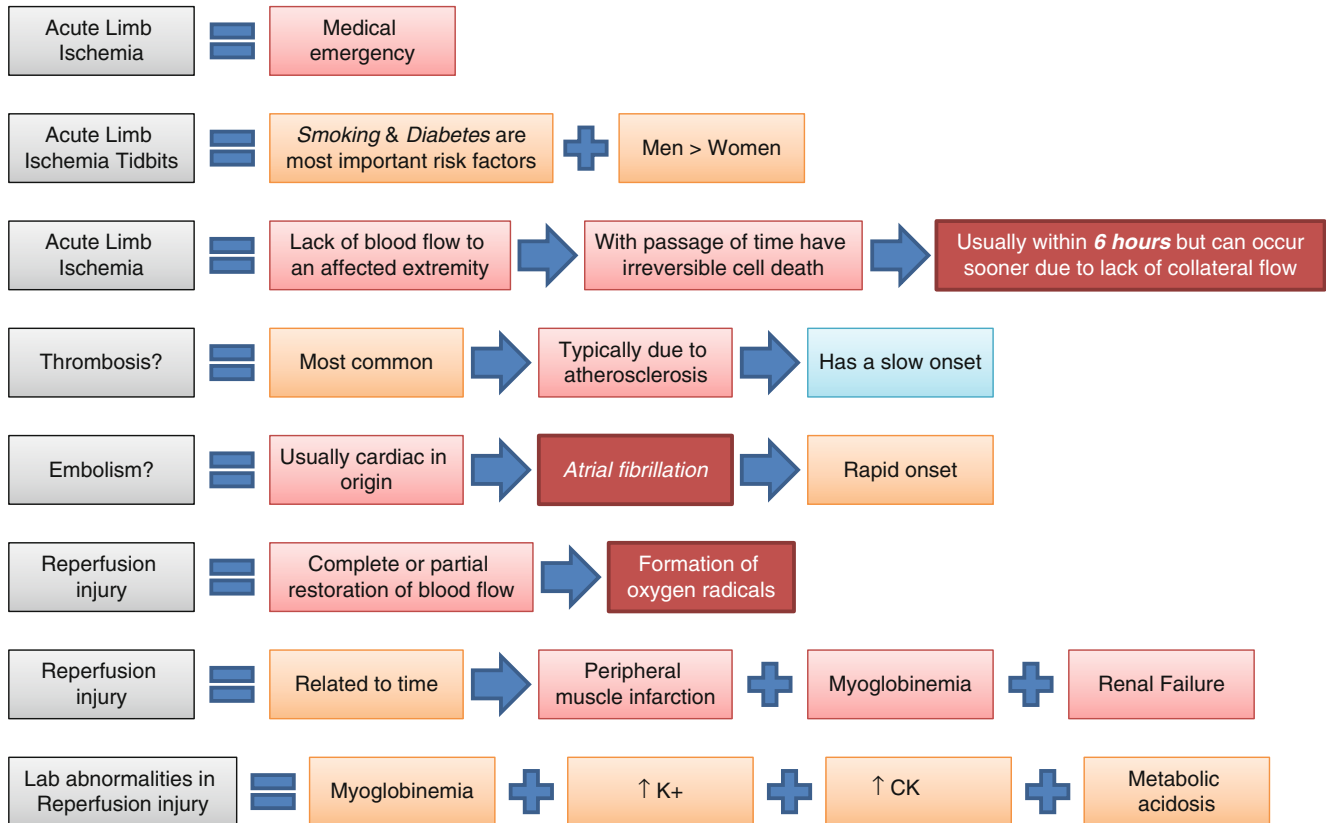


Disposition

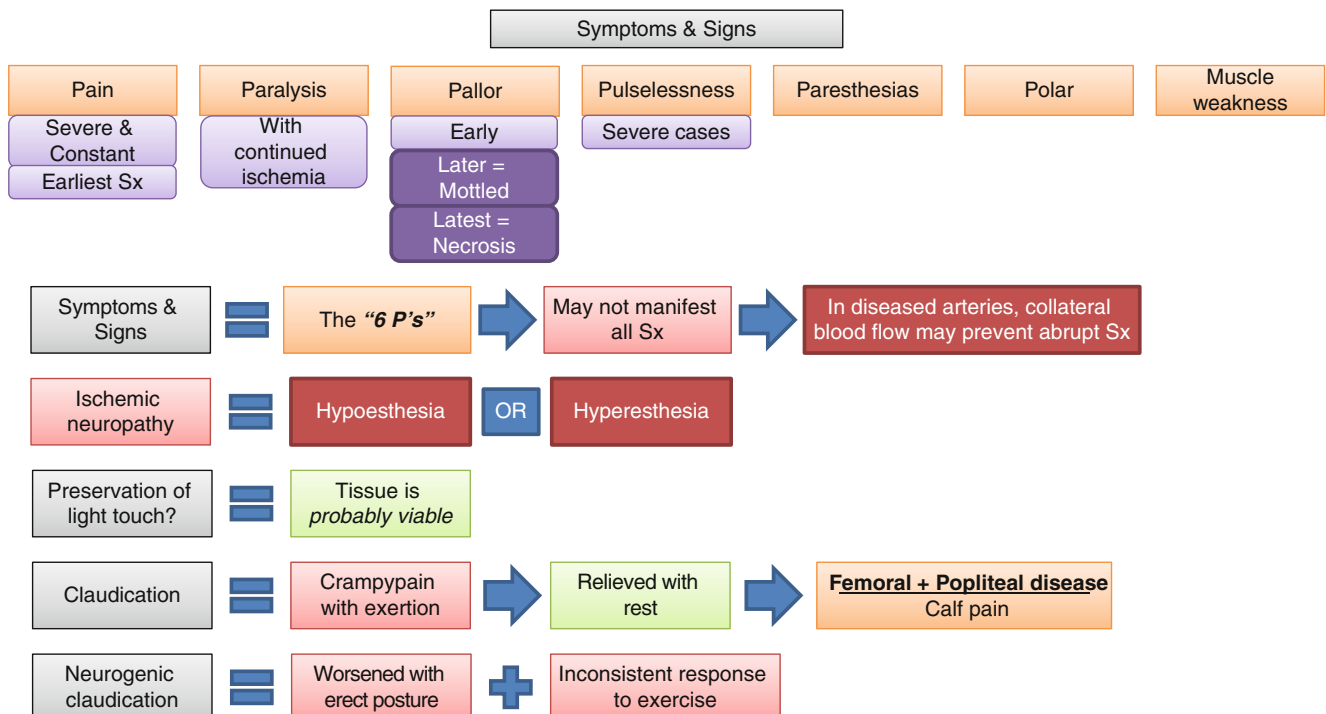


Acute Limb Ischemia

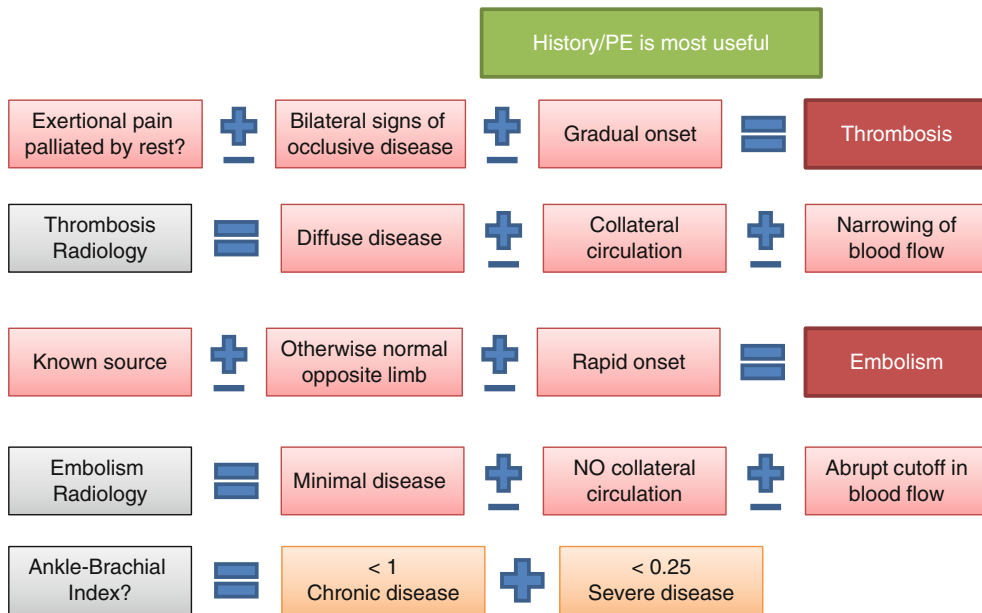
Introduction



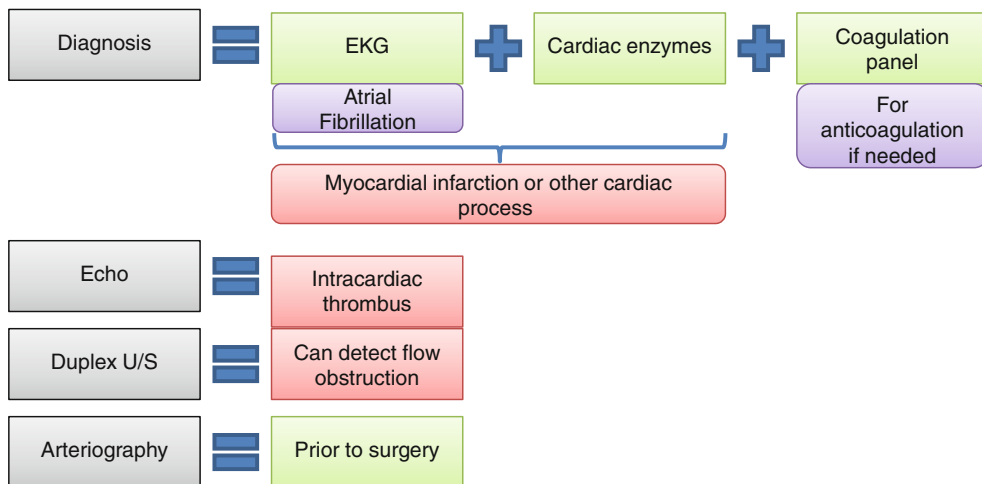
Clinical Features



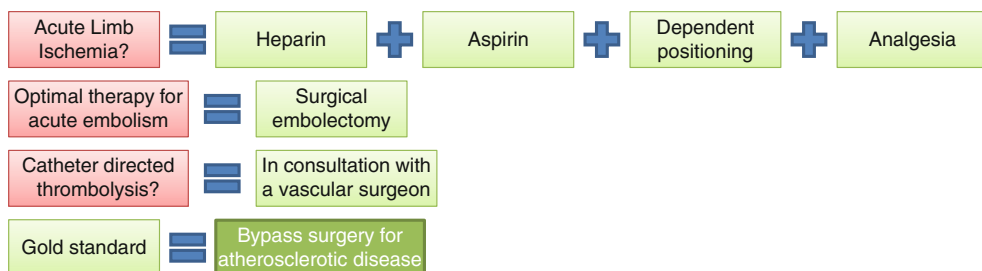
Clinical Diagnosis



Diagnosis

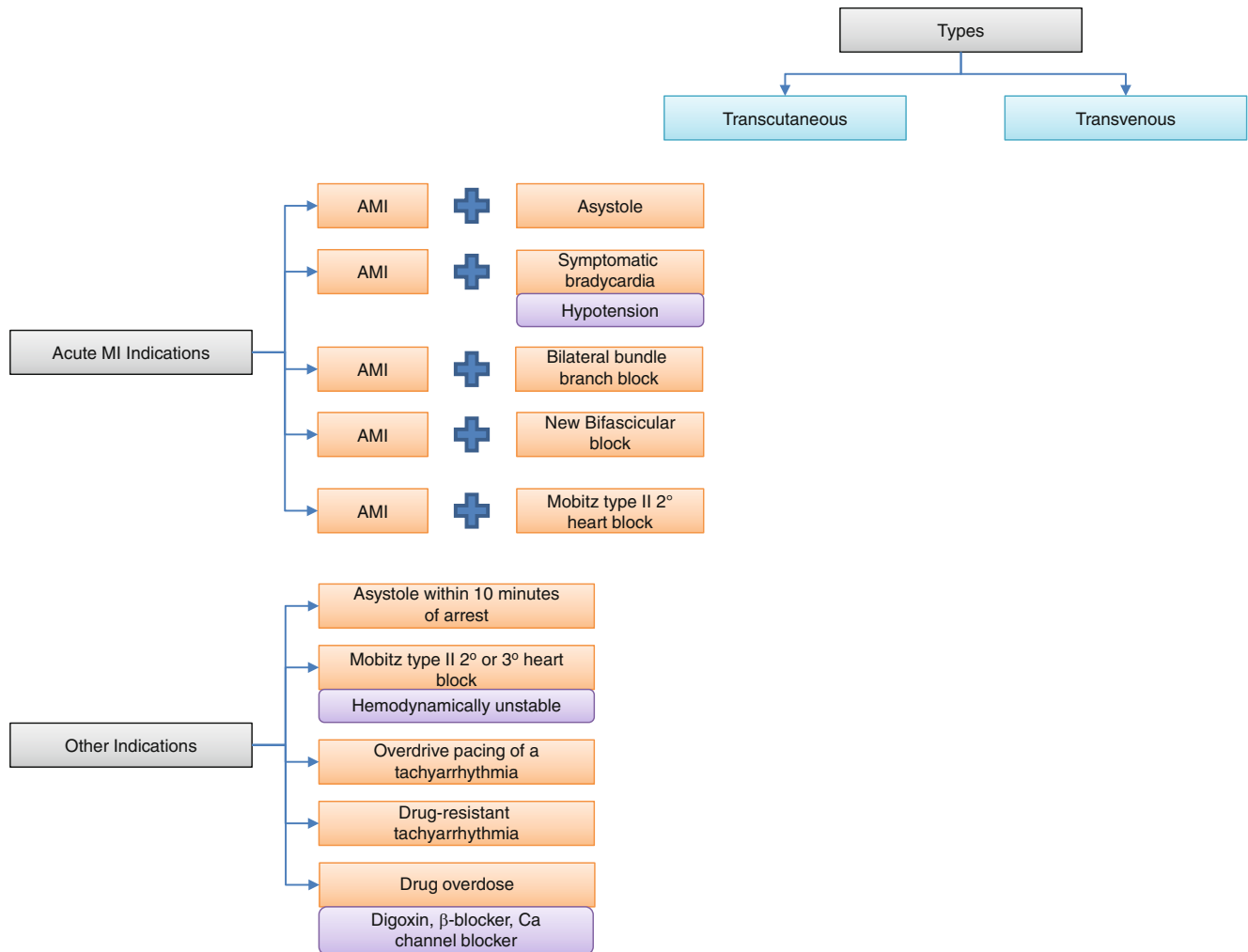


Treatment

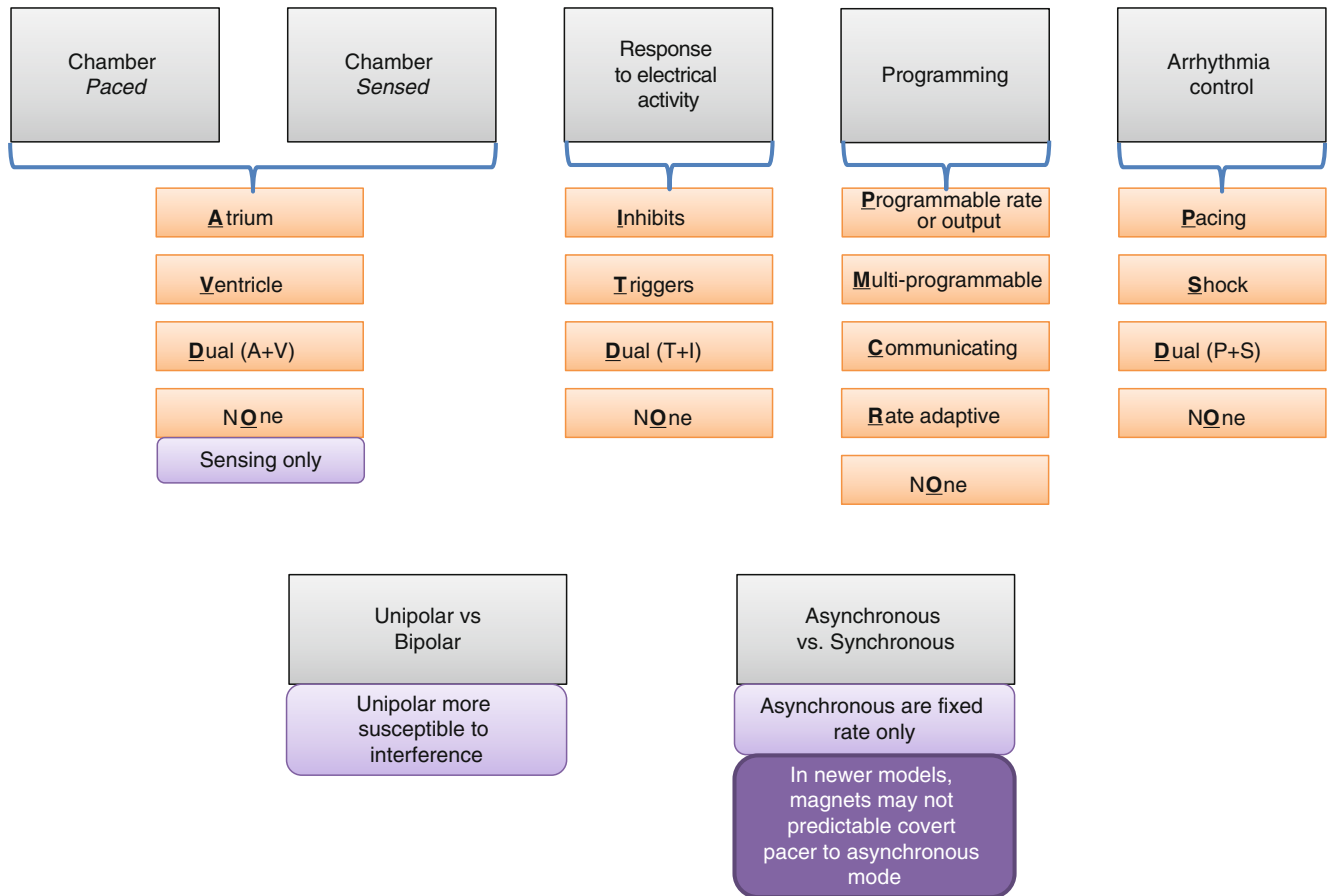


Pacemakers

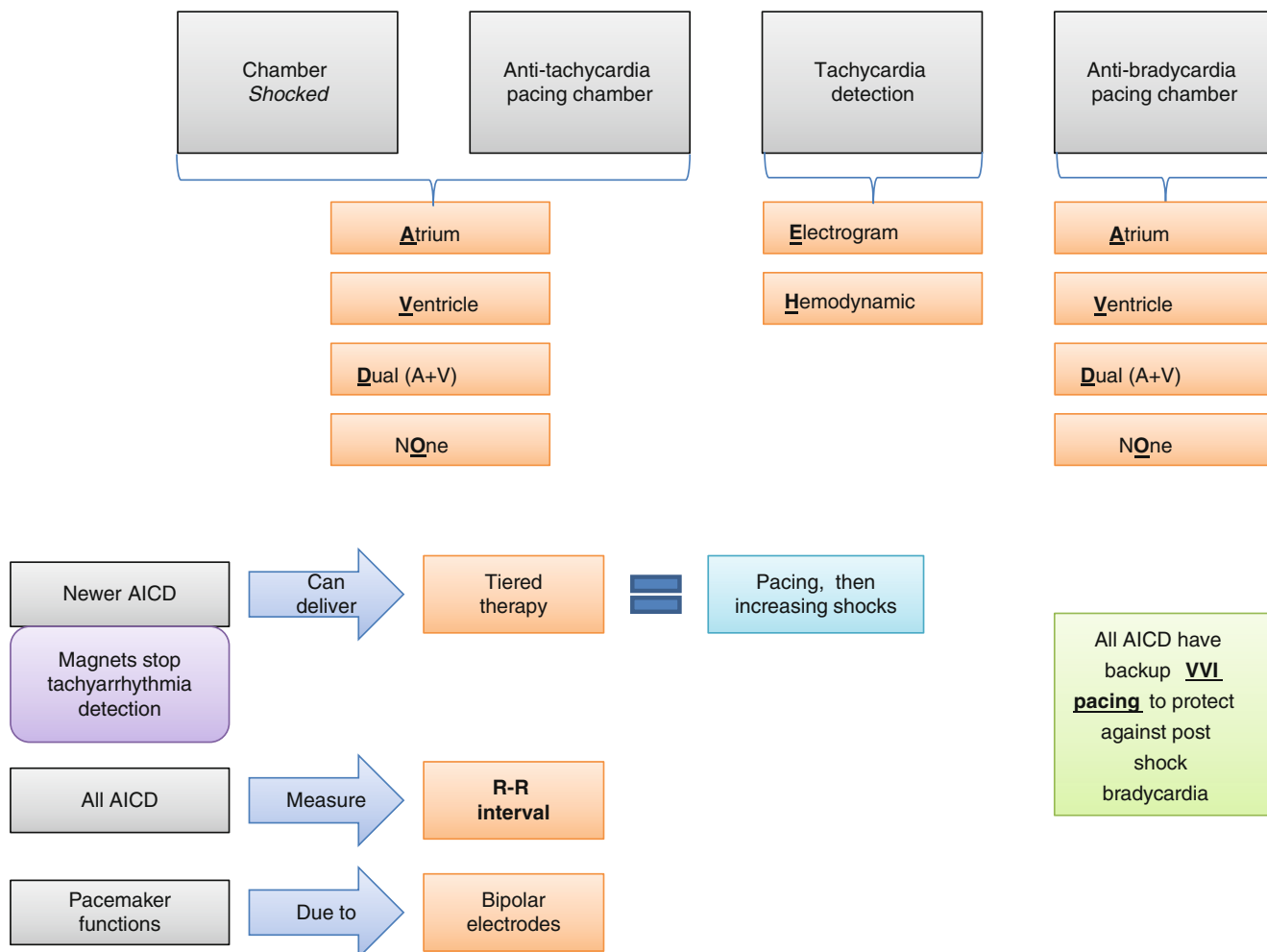
Emergency Pacing



Pacemaker Nomenclature



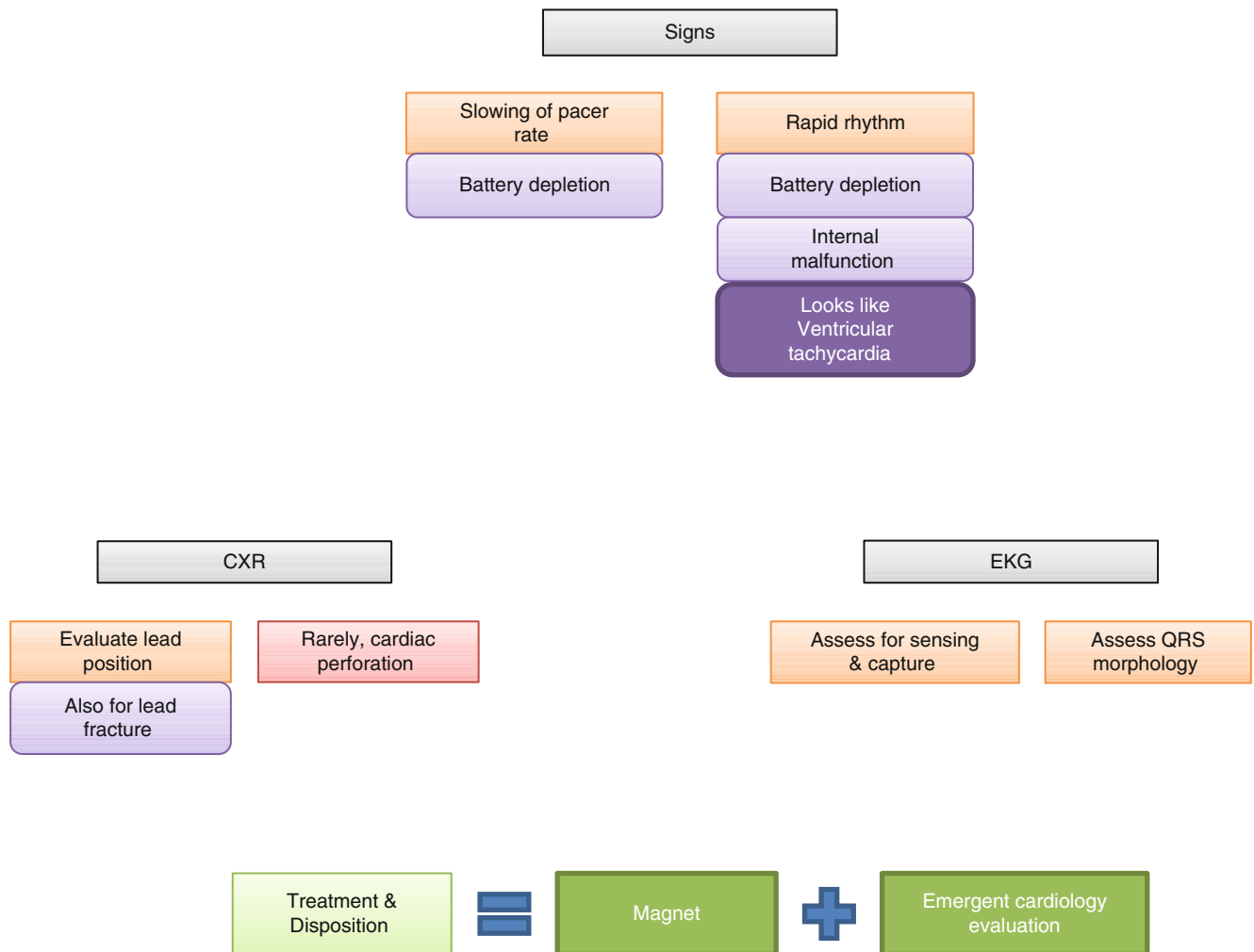
Automatic Implantable Cardioverter: Defibrillator Nomenclature



Specific Pacemaker Malfunctions

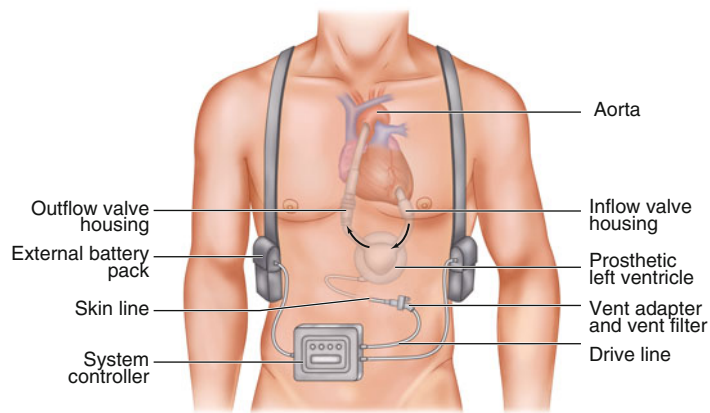
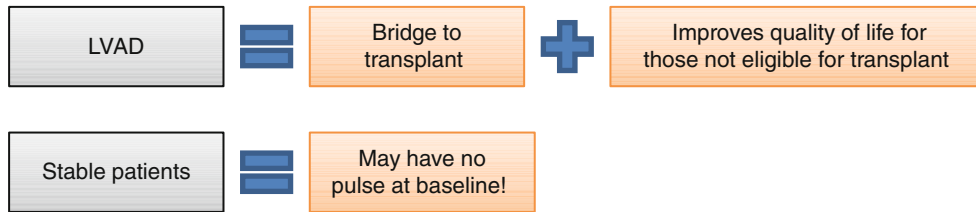


Pacemaker Failure

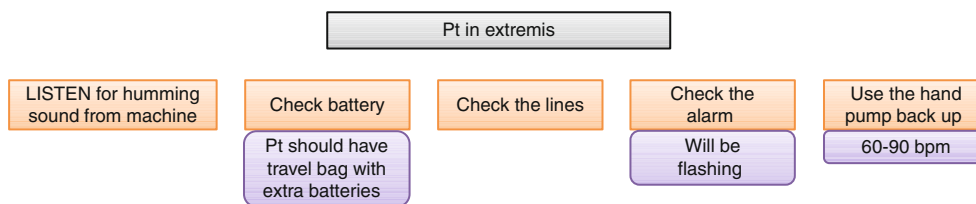


Left Ventricular Assist Devices (LVAD)

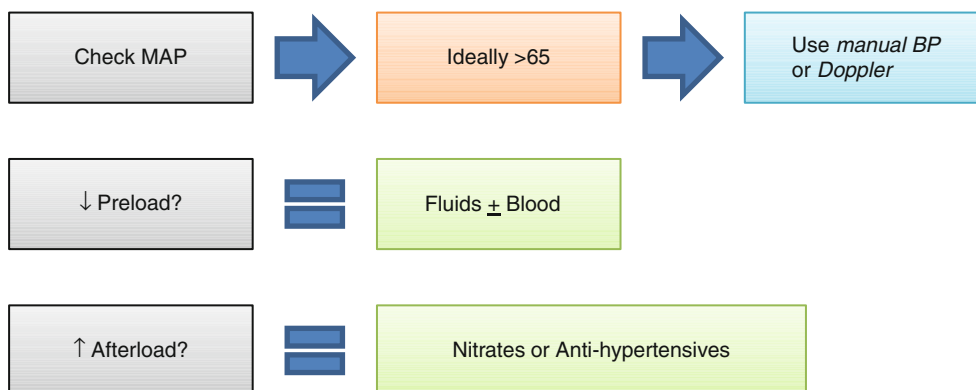
Introduction



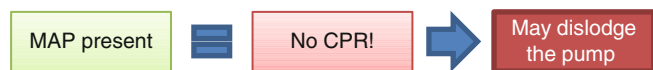
LVAD Emergencies



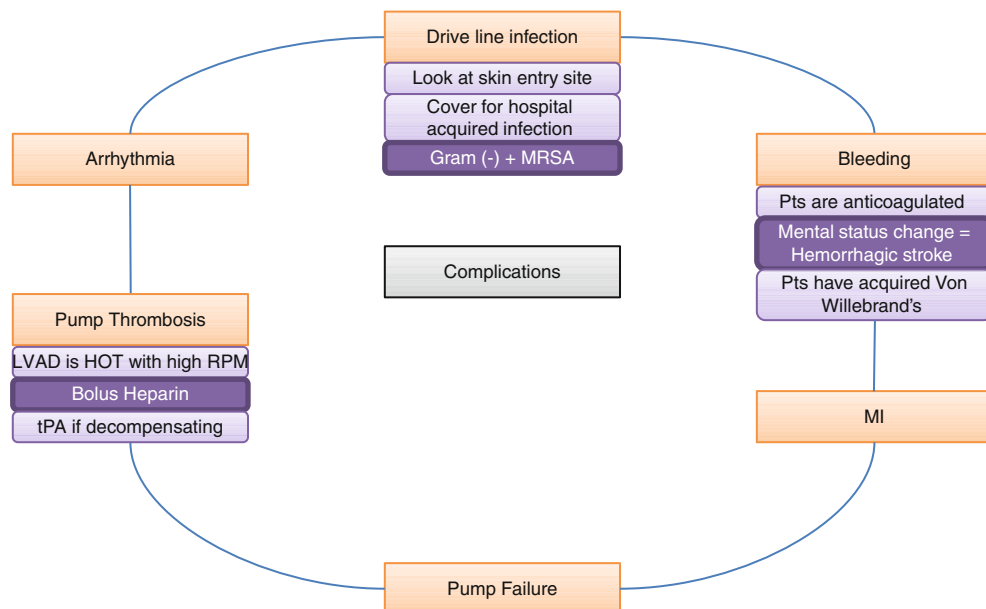
LVAD: Patient Assessment



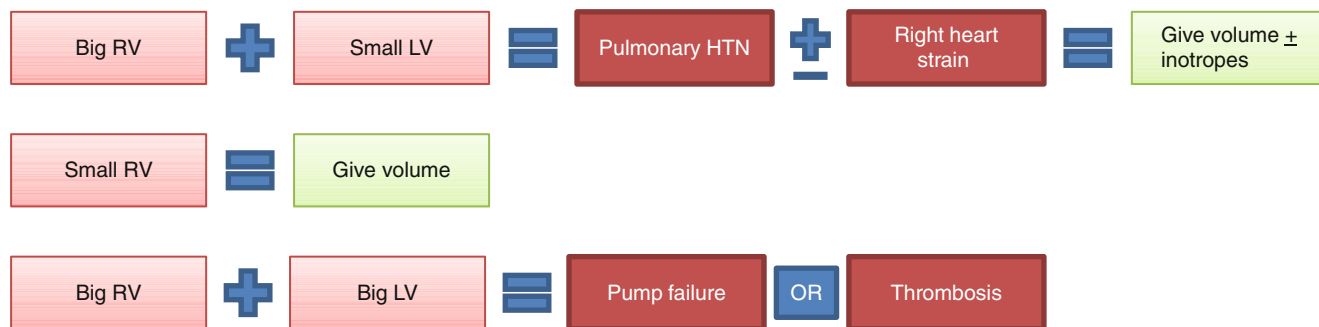
Coding with LVAD



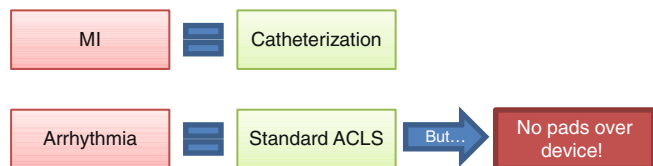
LVAD Complications



Echo Findings



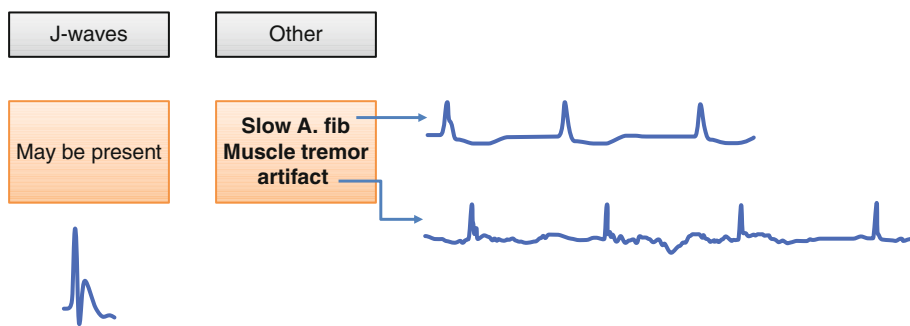
EKG in LVAD



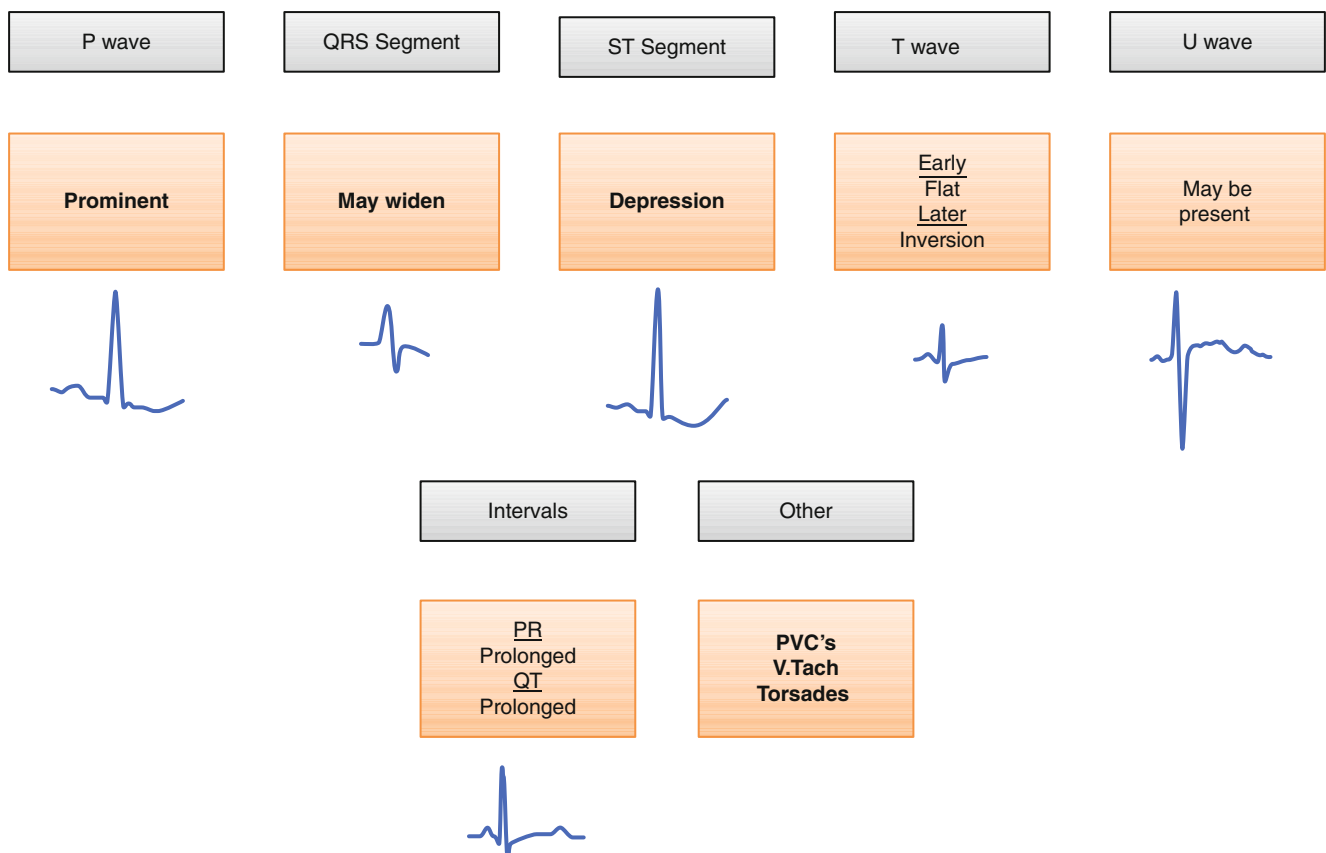
EKG Changes Related to Electrolytes and Metabolic Conditions

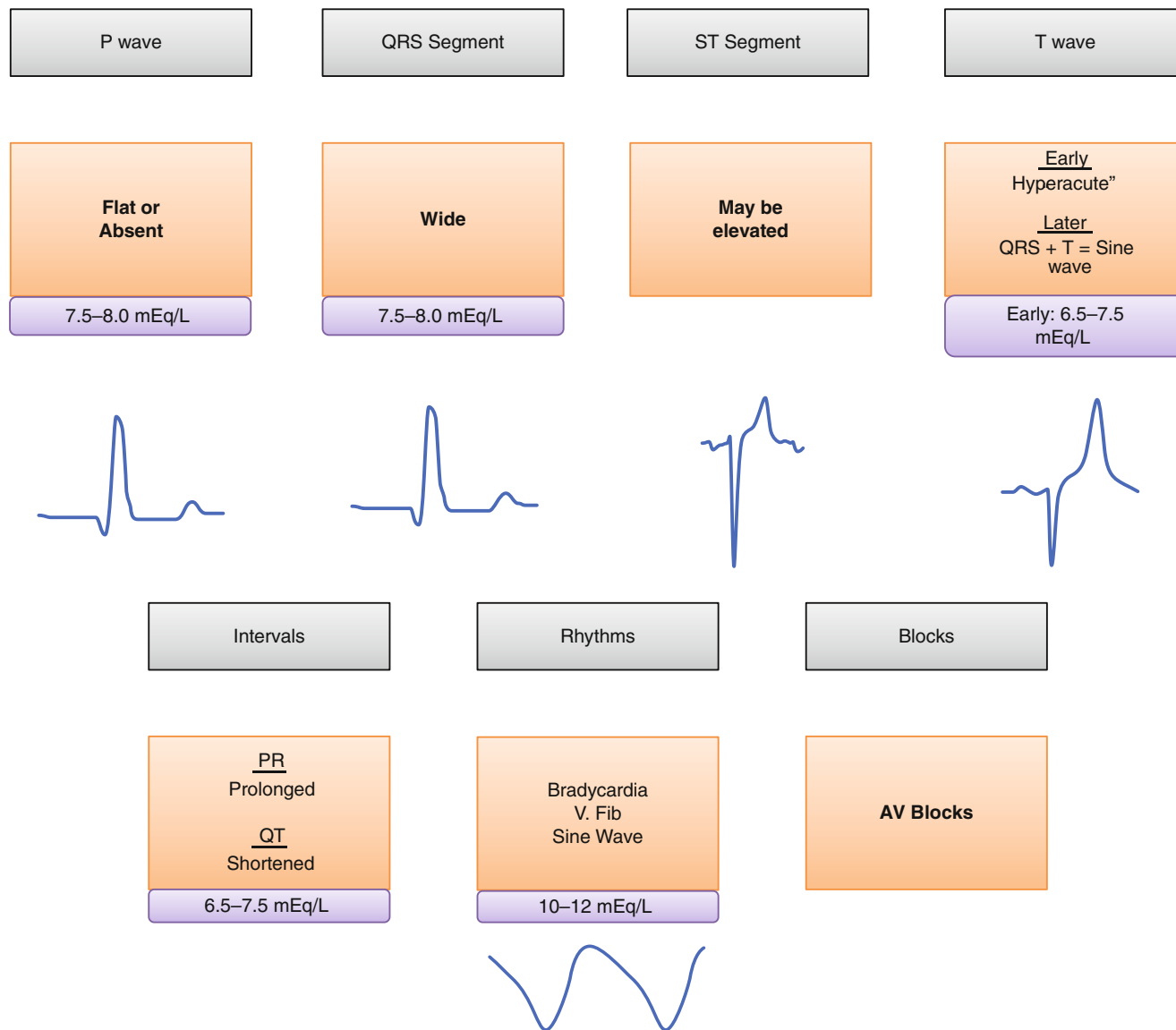
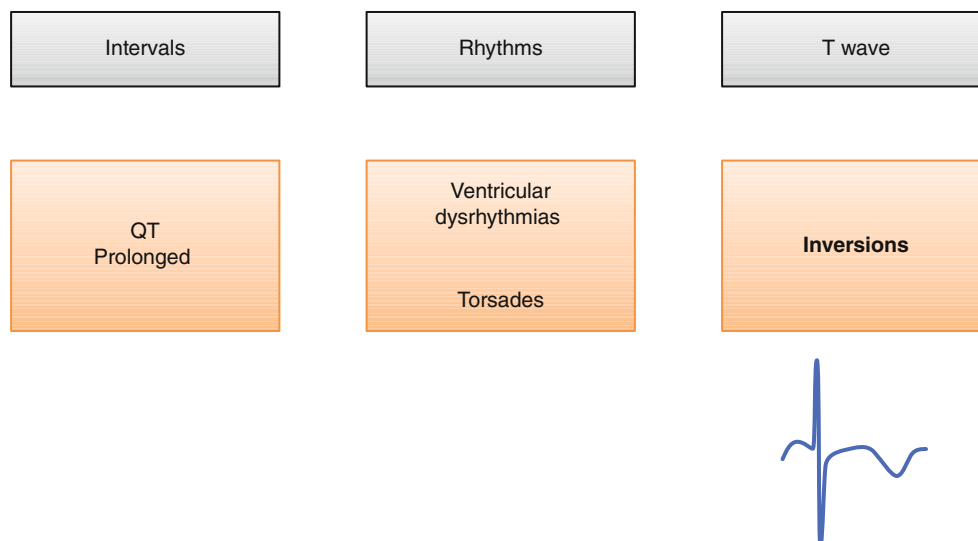
Hypothermia: EKG Changes

PR interval	QRS Segment	QT Interval	30–32 °C	28–30 °C
Prolonged	Prolonged	Prolonged	Sinus Bradycardia + Other Arrhythmias	V. Fib + Asystole

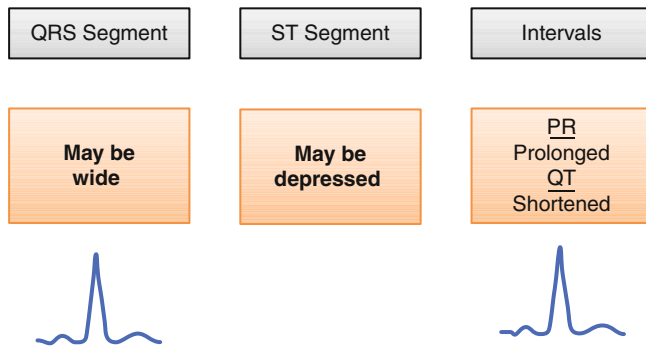


Hypokalemia: EKG Changes

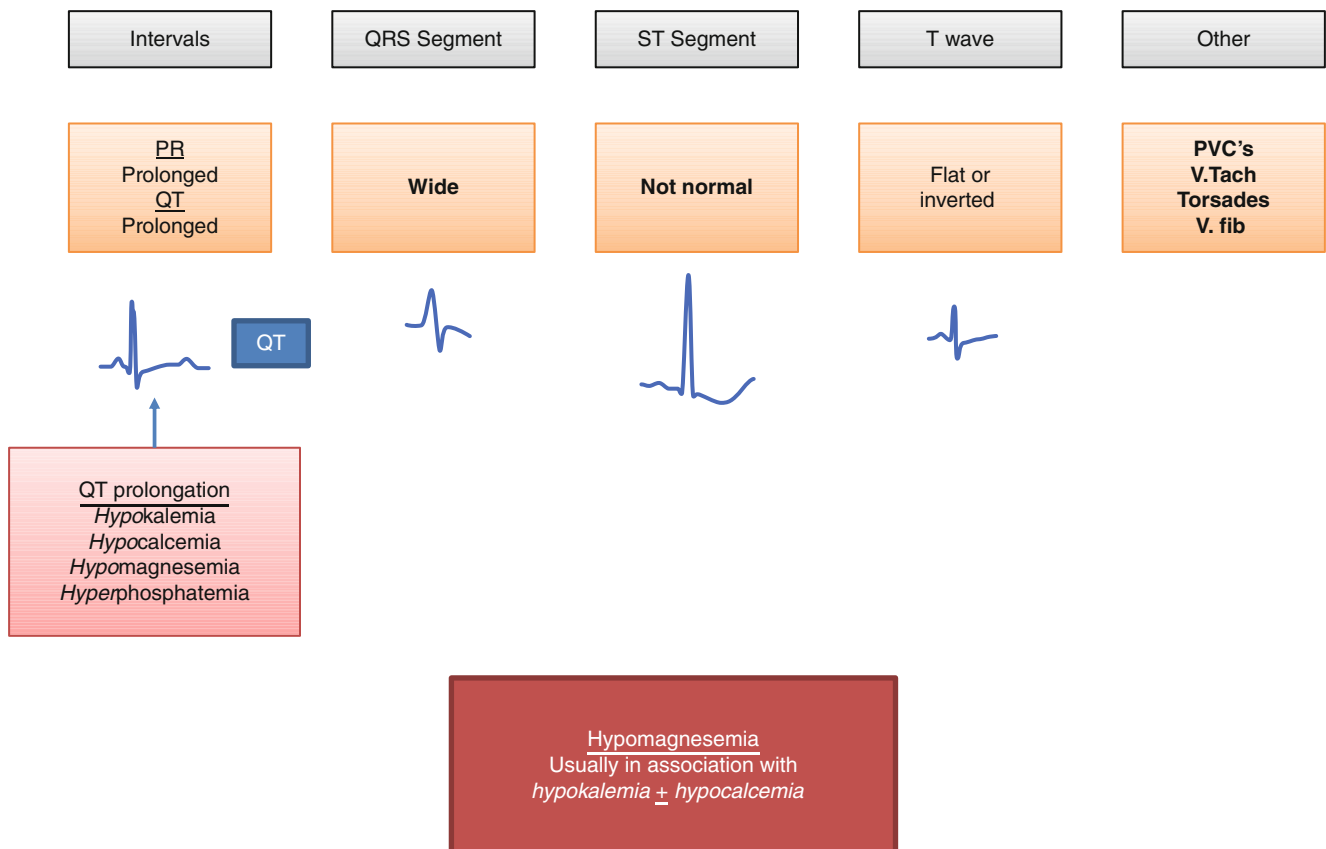


Hyperkalemia: EKG Changes**Hypocalcemia: EKG Changes**

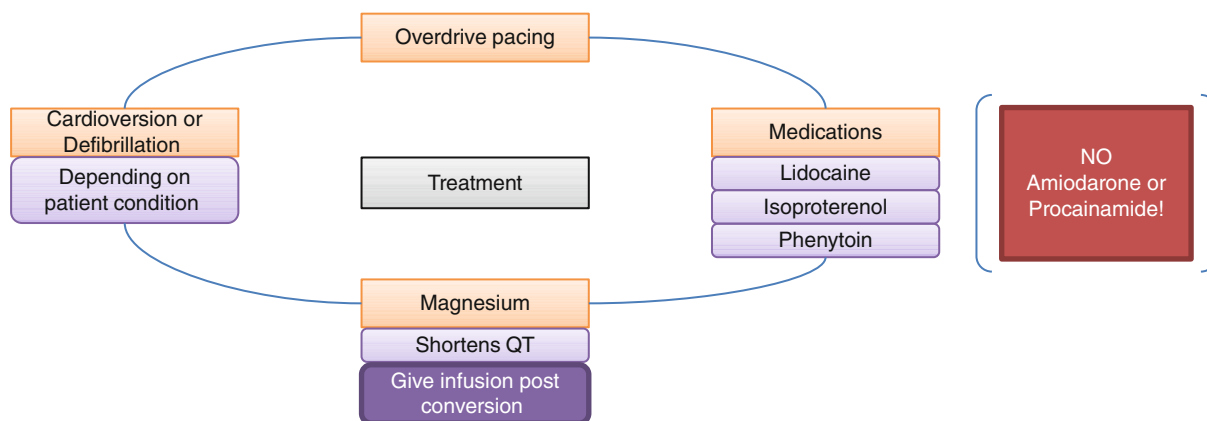
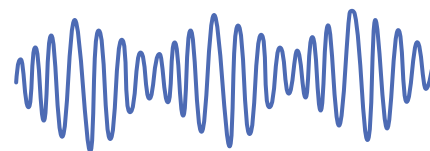
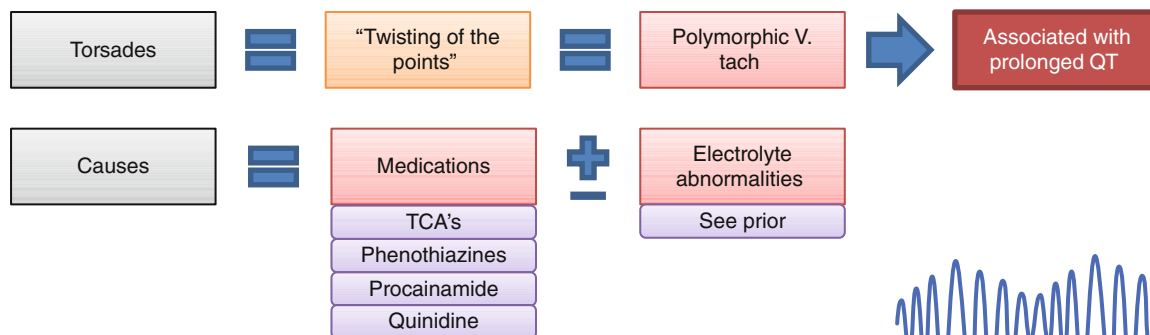
Hypercalcemia: EKG Changes



Hypomagnesemia: EKG Changes



Torsades De Pointes



EKG Changes Related to Medications

Digitalis: EKG Changes

Intervals

PR
Prolonged
QT
Shortened

ST Segment

Sagging,
Concave
upwards
(dig effect and
may be normal)



T wave

Flat or
inverted

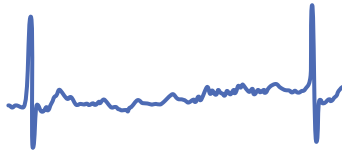


Rhythms &
Blocks

PVC's (most common)
AV dissociation
PAT with blocks
Sinus bradycardia
SA blocks
AV blocks
Bidirectional V.tach
Slow A. Fib
Junctional tachycardia
Sinus Arrest

PAT with block

Pathognomonic



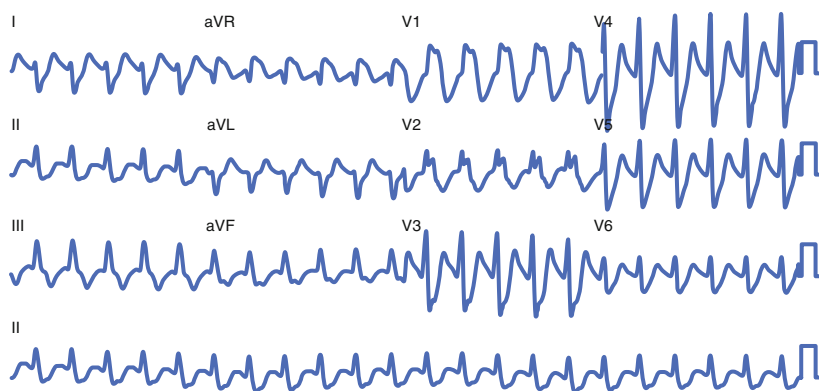
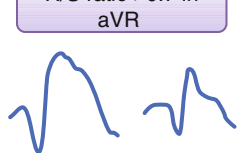
Bidirectional V.
Tach

Rare but
suggests
Digitalis toxicity

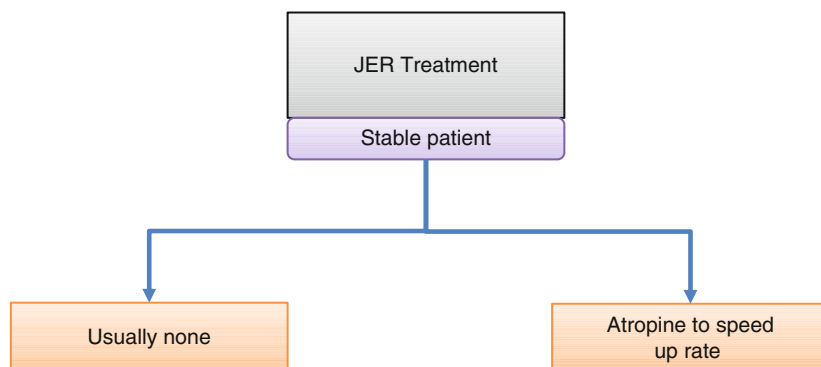
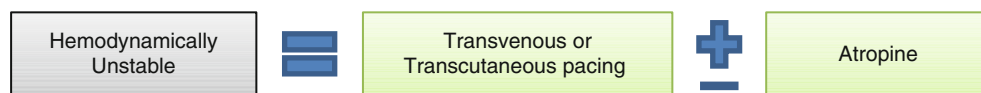


Tricyclic Antidepressants: EKG Changes

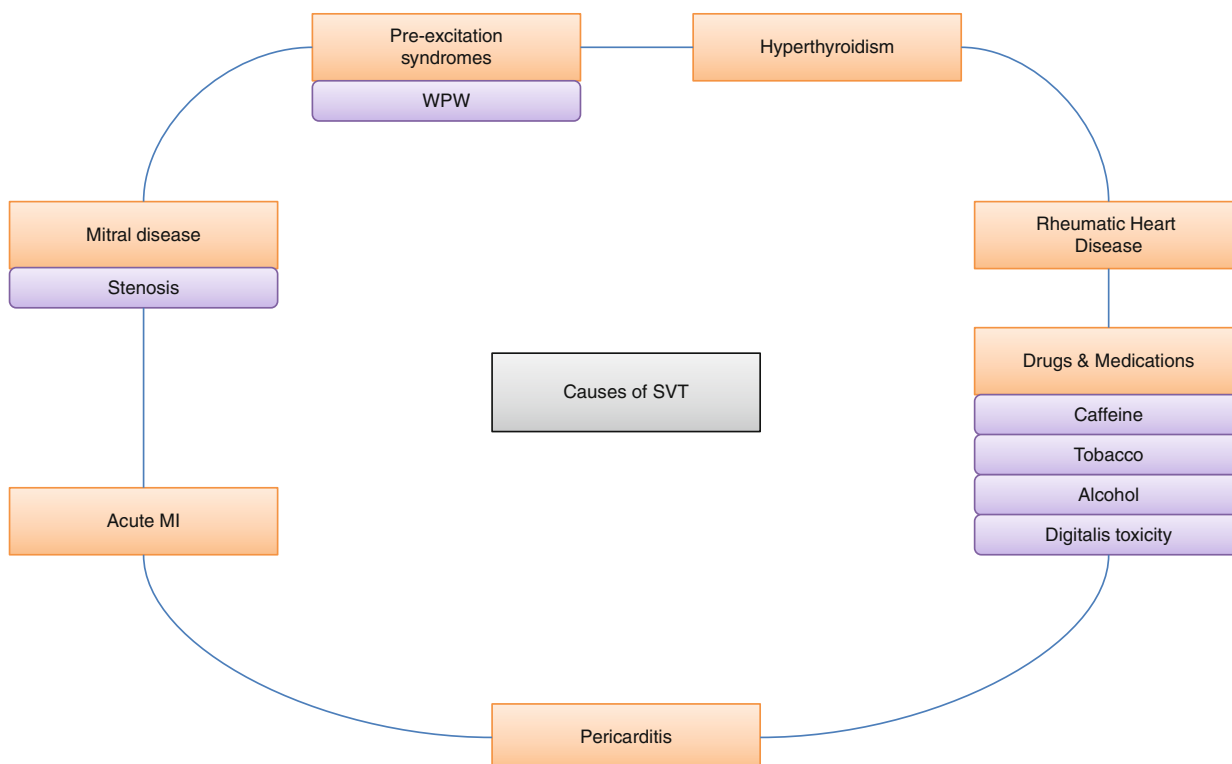
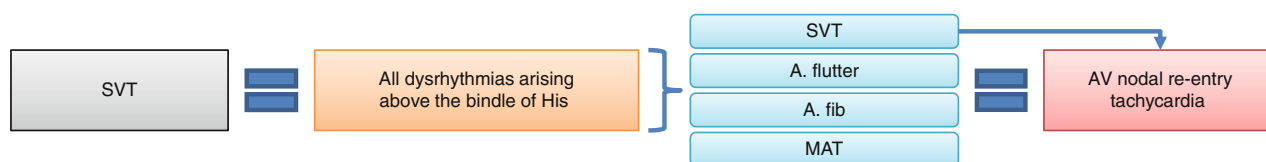
Axis	QRS Segment	QT Interval	Rhythms	Blocks
<p>Right axis deviation</p> <p>Terminal R wave >3mm in aVR</p> <p>R/S ratio >0.7 in aVR</p>	<p>Wide >100 ms</p>	<p>Prolonged</p>	<p>Sinus tachycardia (most common)</p>	<p>May be present</p>
<p>Same effect with other <i>Sodium channel blocking agents</i></p>				
<p>Quinine Propranolol Antimalarials (<i>Chloroquine</i>) Local anesthetics (<i>Bupivacaine</i>) Type 1a antiarrhythmics (<i>Quinidine, Procainamide</i>) Type 1c antiarrhythmics (<i>Flecainide, Encainide</i>)</p>				



JER Treatment

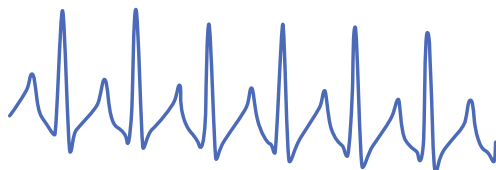


Supraventricular Tachycardia (SVT)

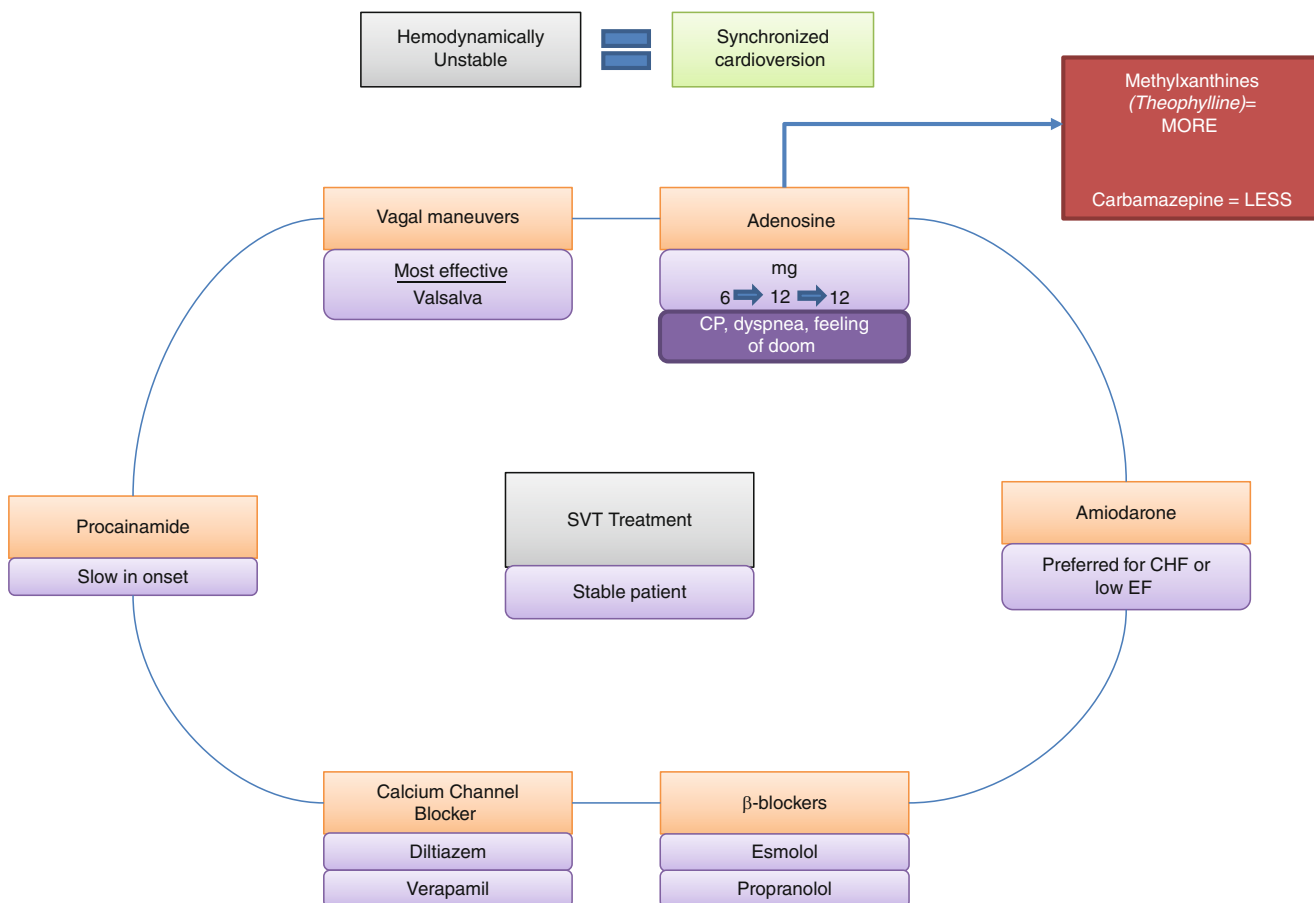


SVT: EKG Changes

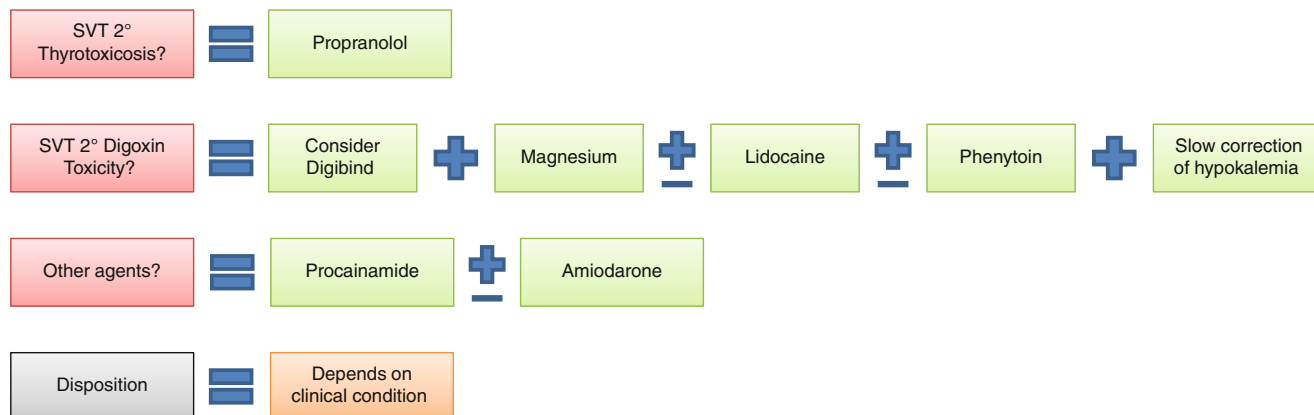
P waves	QRS Complex	Rhythm
May be absent May be retrograde	Narrow	Regular



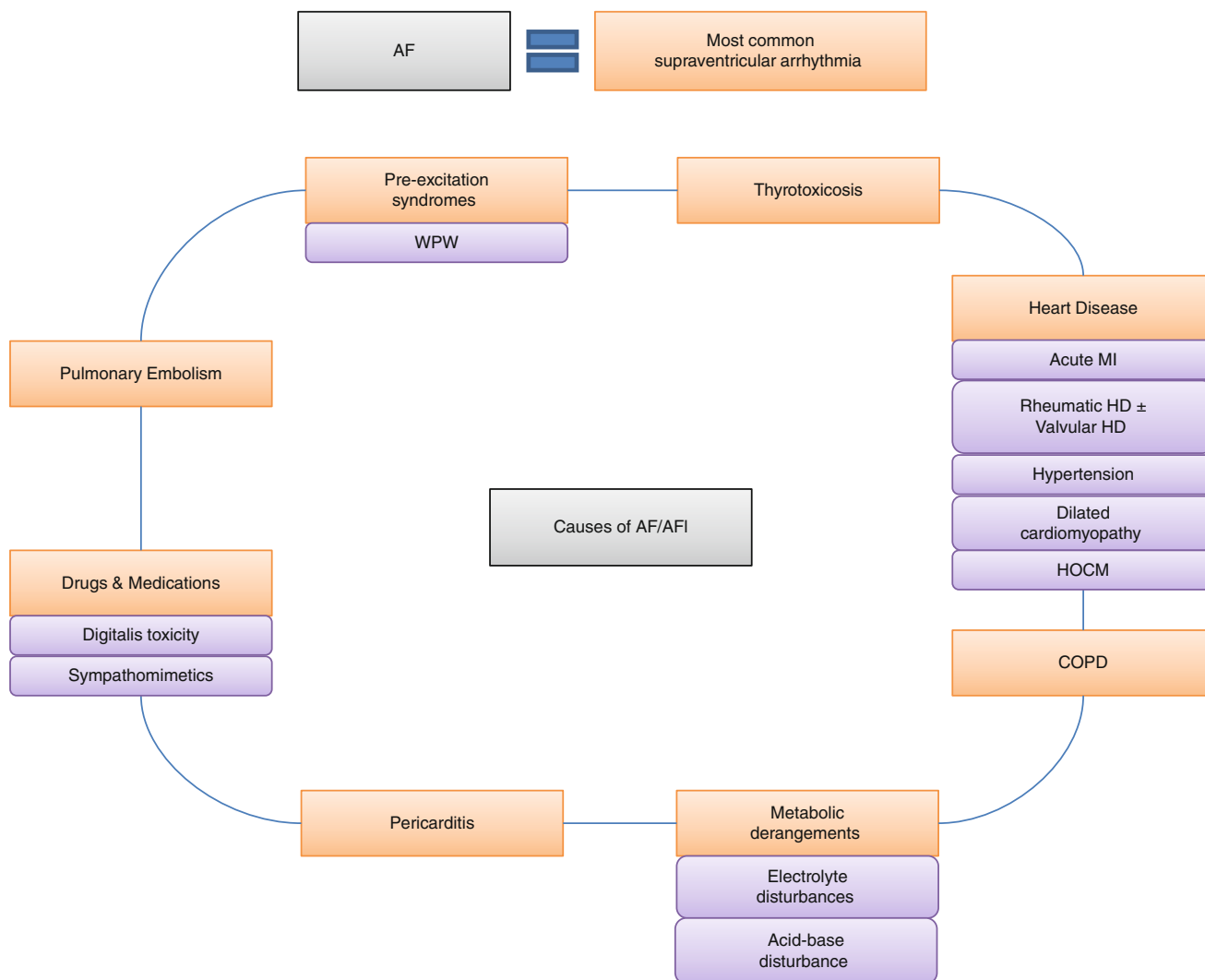
SVT Treatment



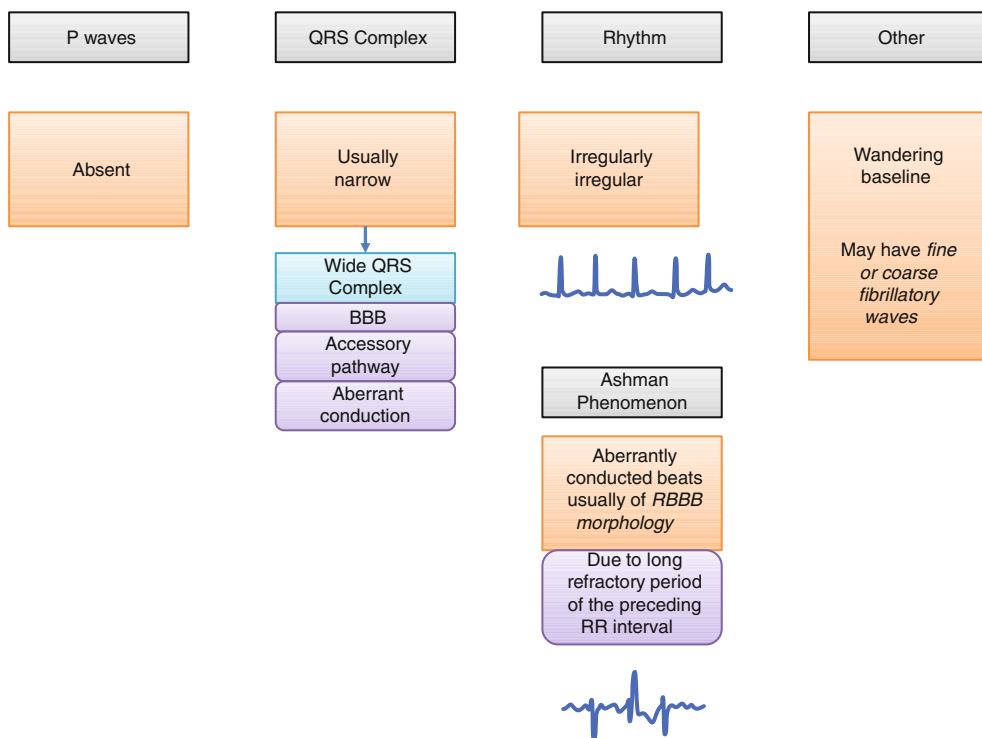
Other Choices for SVT Treatment



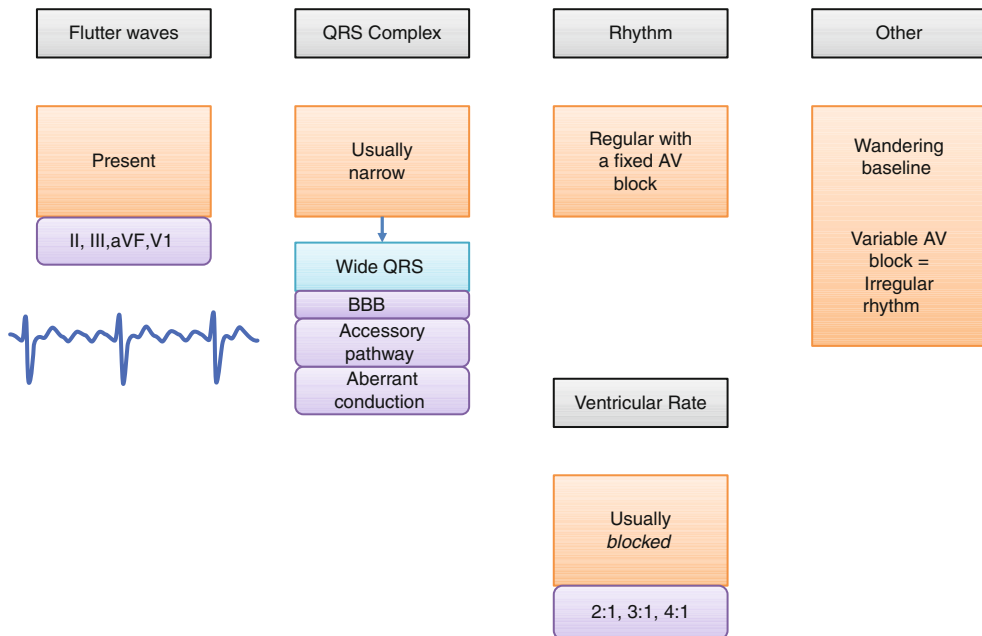
Atrial Fibrillation (AF) and Atrial Flutter (AFL)



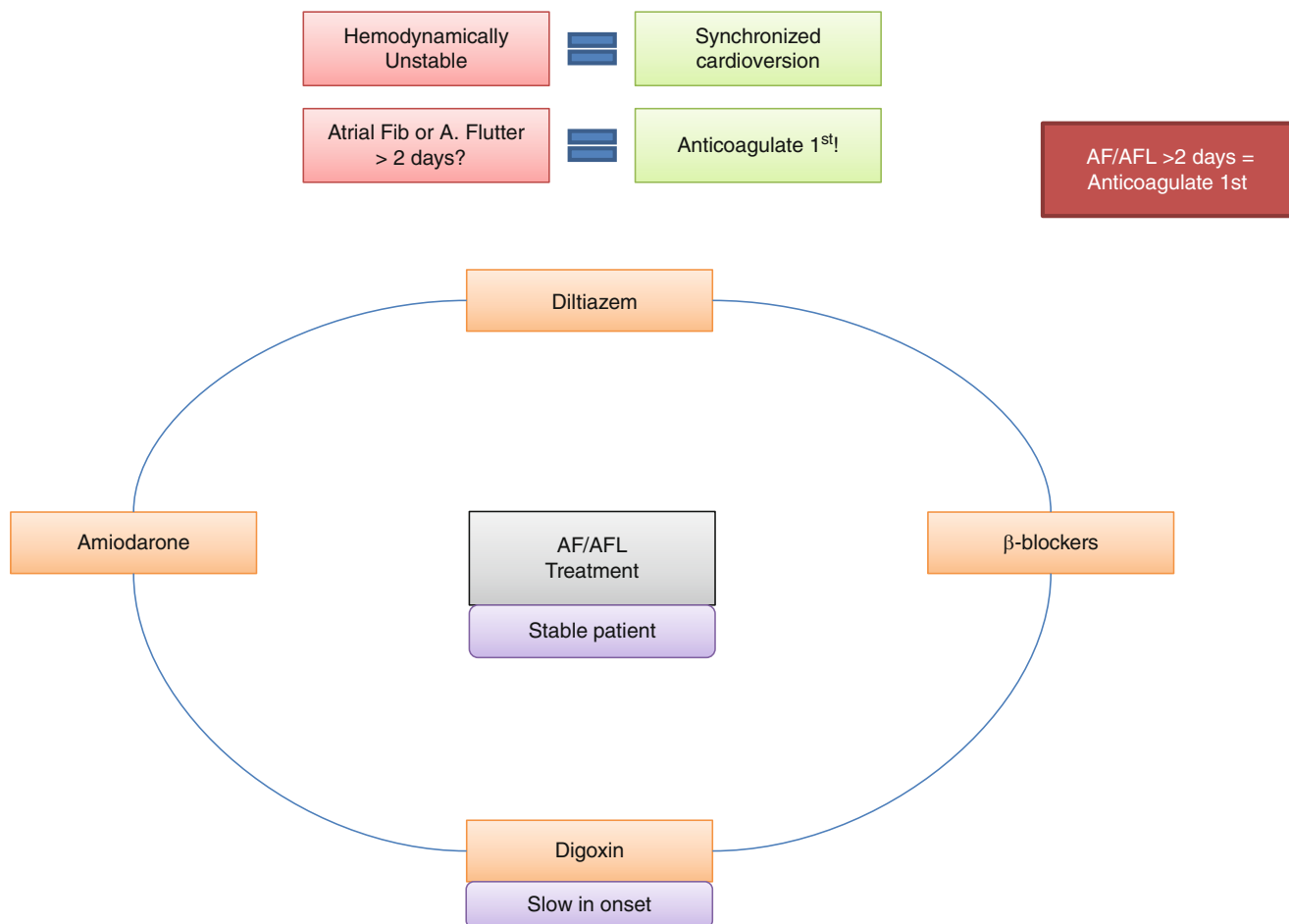
AF: EKG Changes



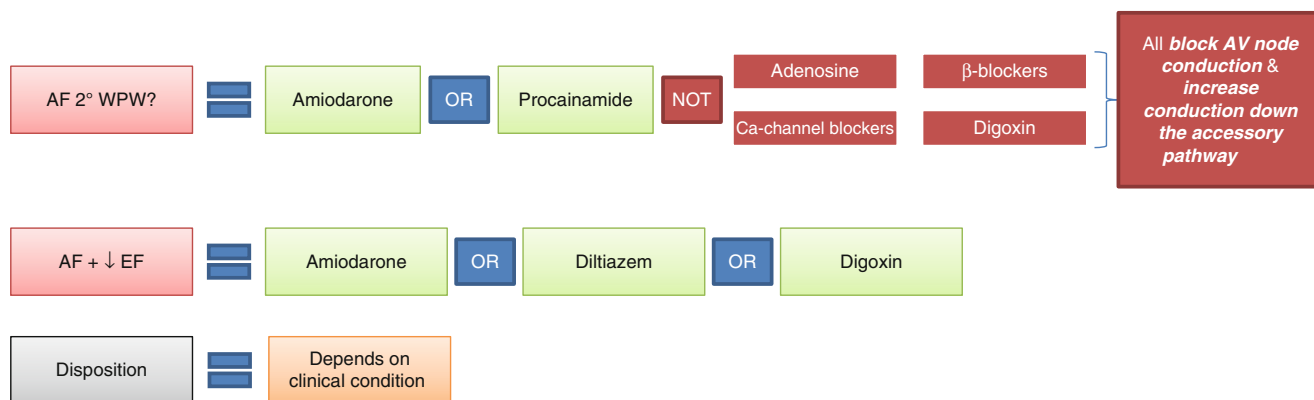
Atrial Flutter: EKG Changes



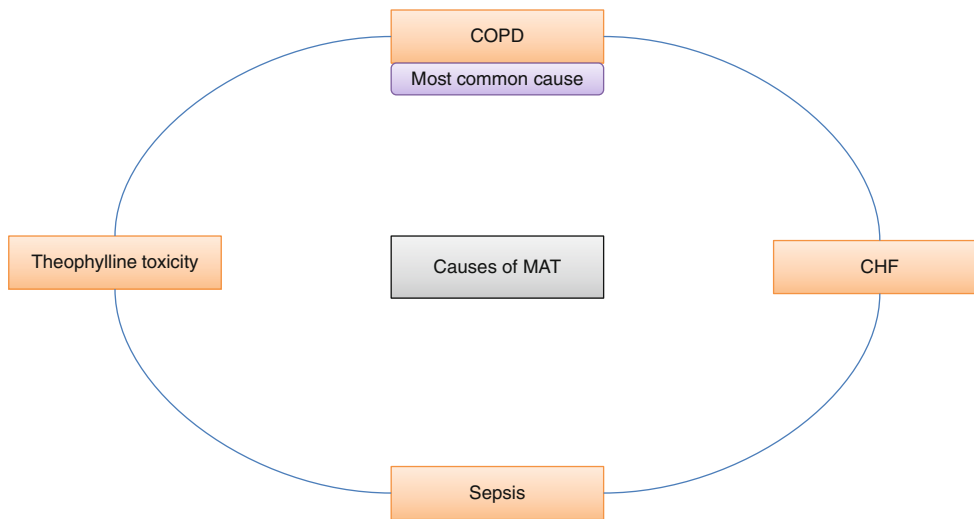
AF/AFL Treatment



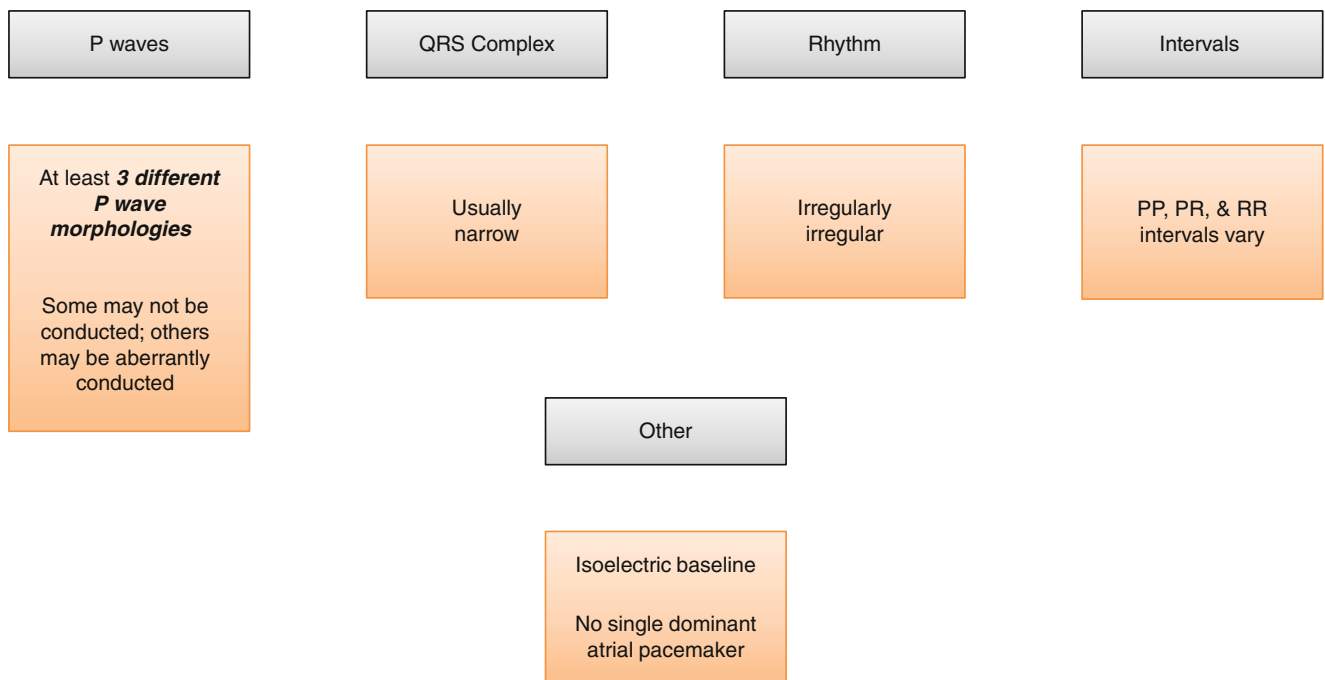
Other Tidbits Concerning AF/AFL



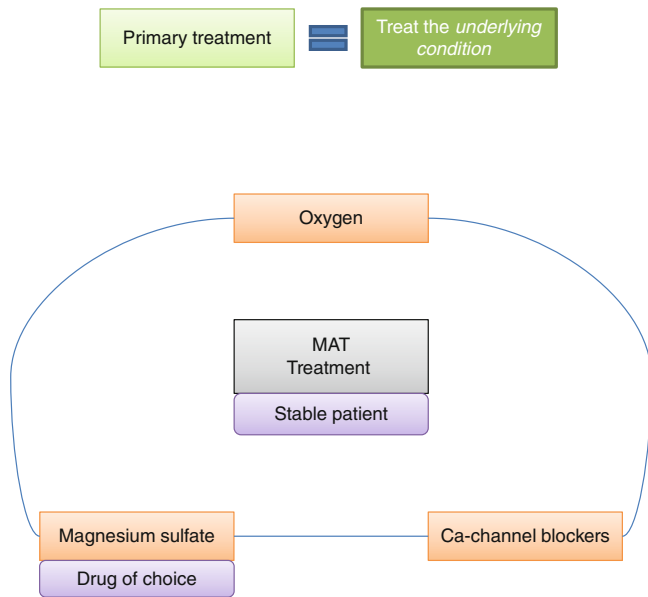
Multifocal Atrial Tachycardia (MAT)



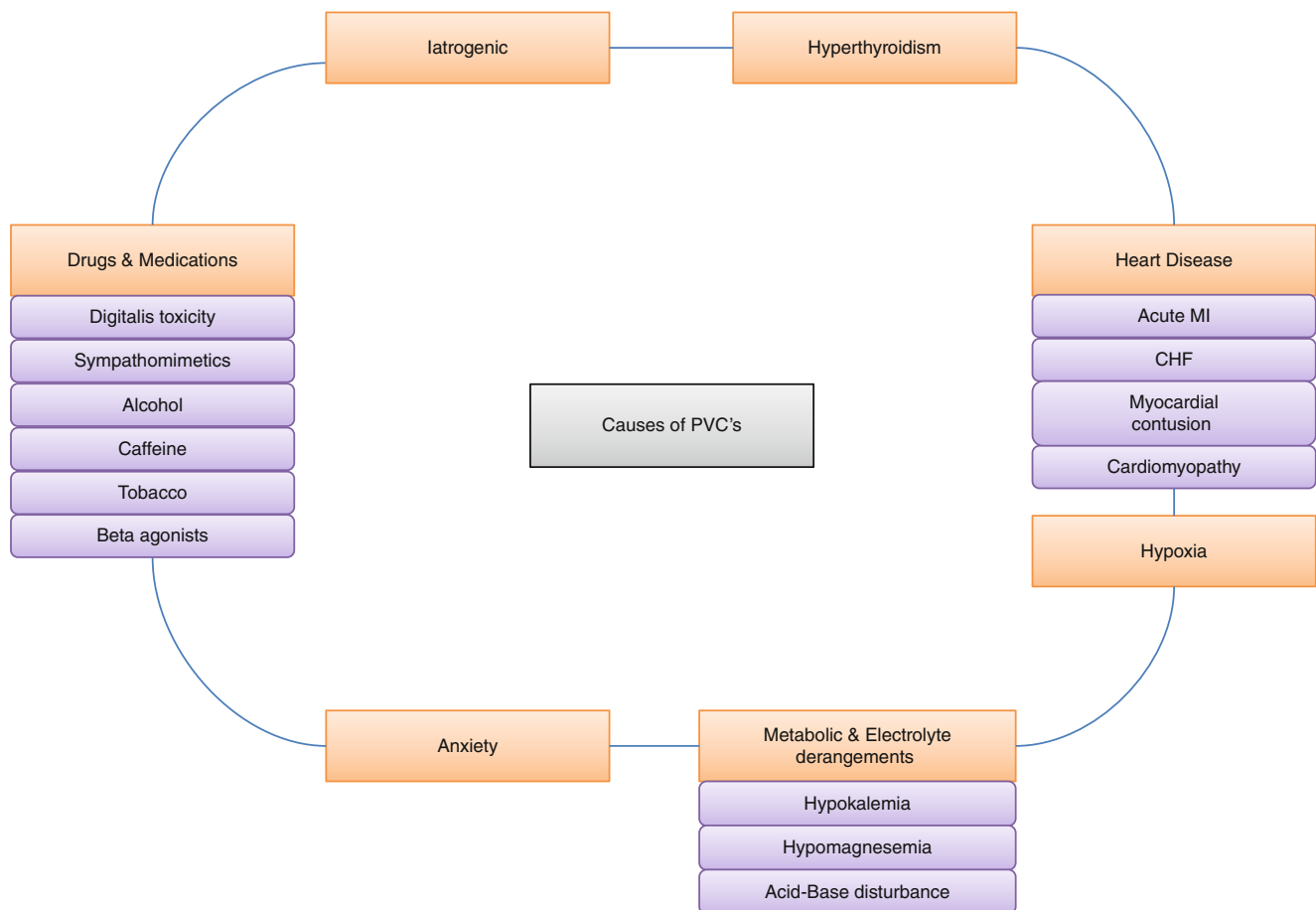
MAT: EKG Changes



MAT Treatment



Premature Ventricular Contractions

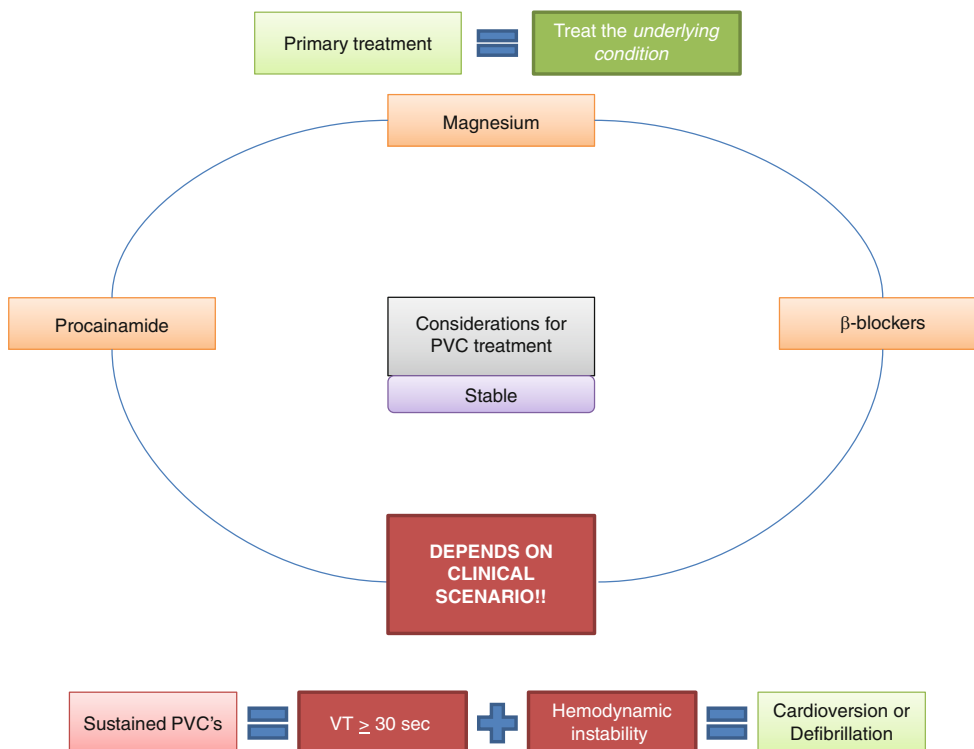


PVCs: EKG Changes

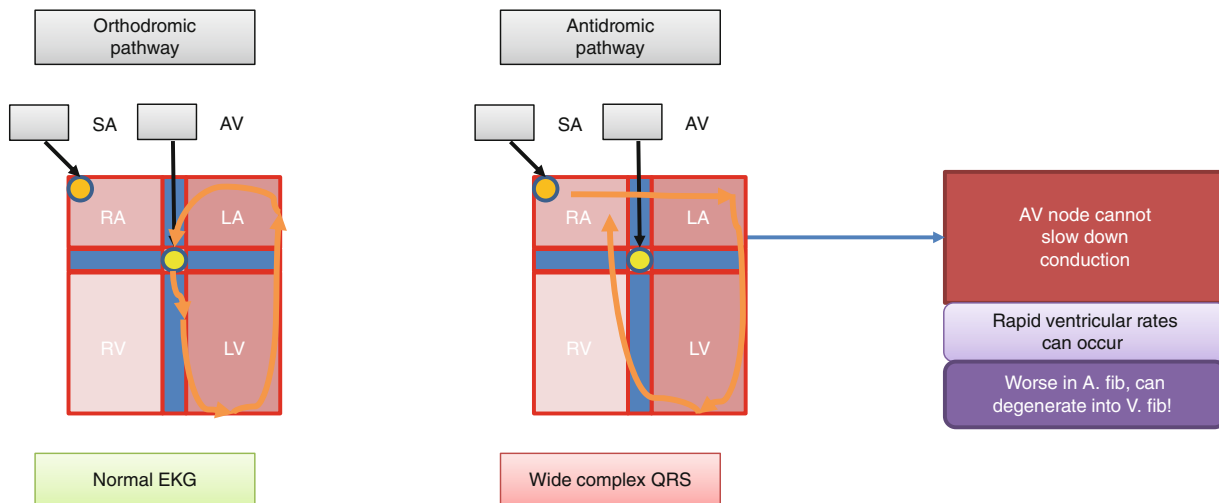
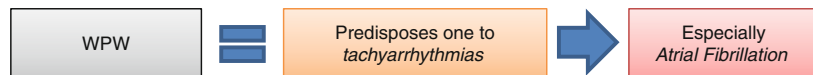
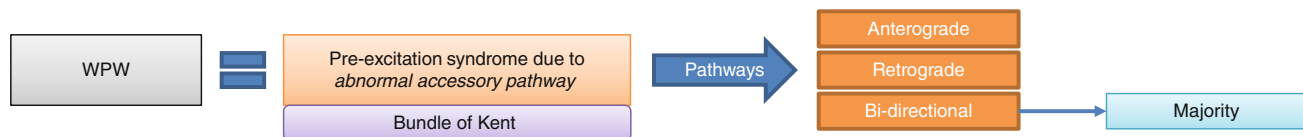
P waves	QRS Complex	Rhythm	Other
Absent	Wide	Varies	Compensatory pause Unifocal or Multifocal



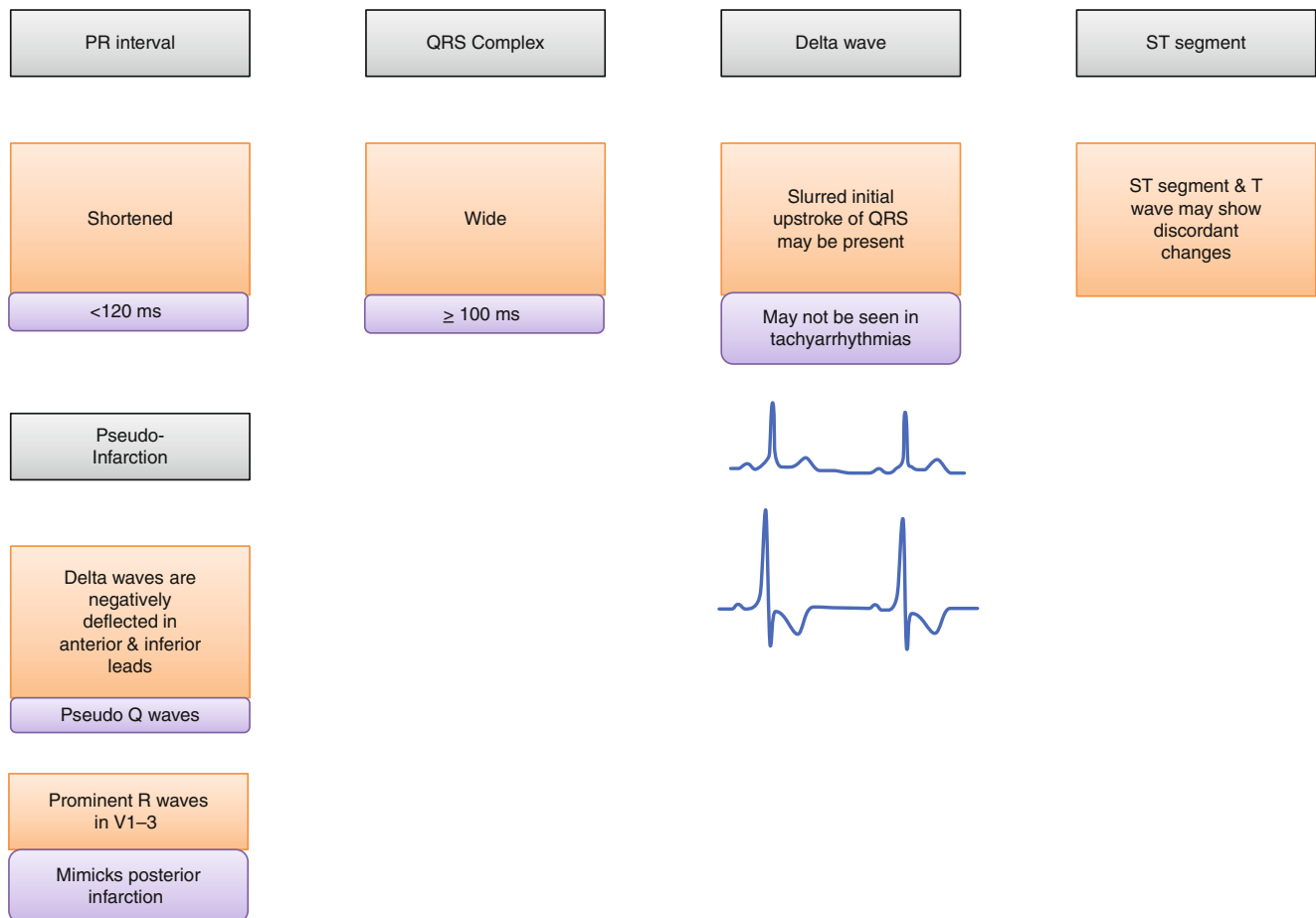
PVC Treatment



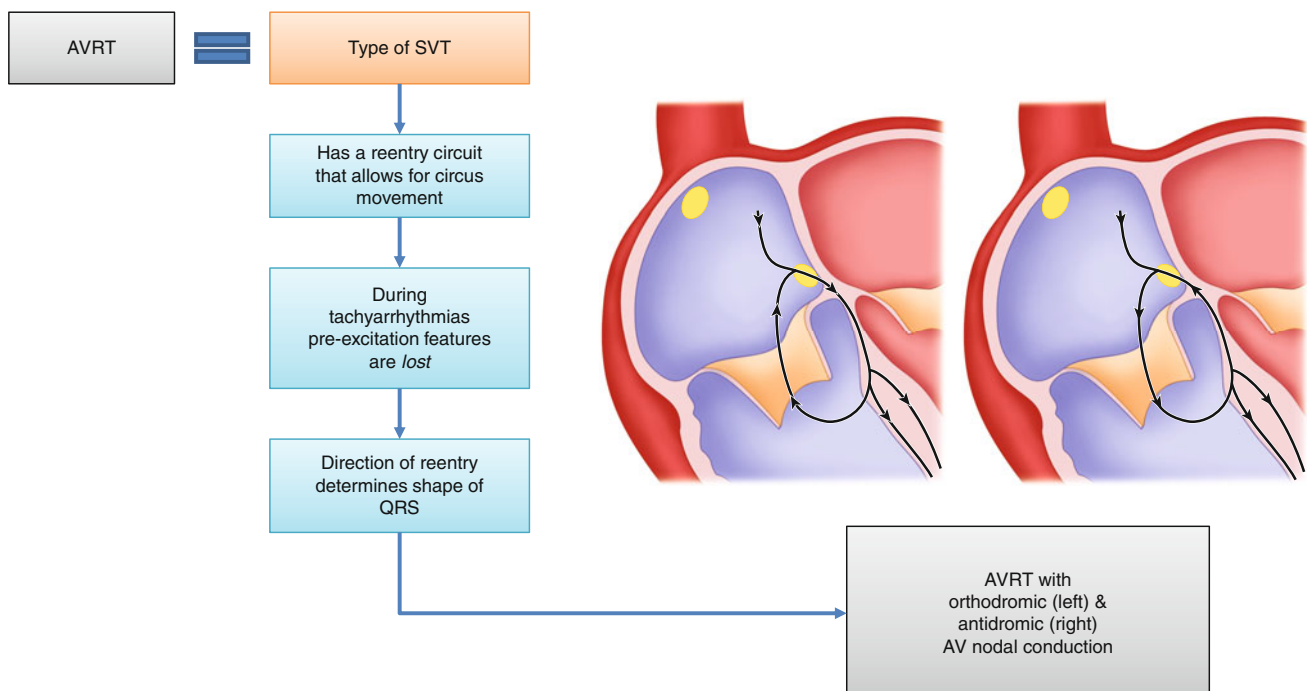
Wolff-Parkinson-White (WPW) Syndrome




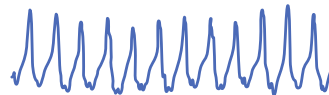
WPW: EKG Changes in Sinus Rhythm



Atrioventricular Reentry Tachycardias (AVRT): RD

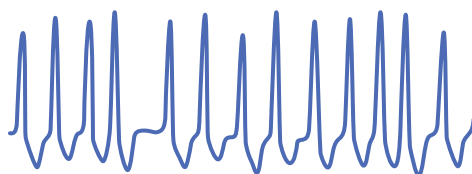


AVRT: EKG Changes

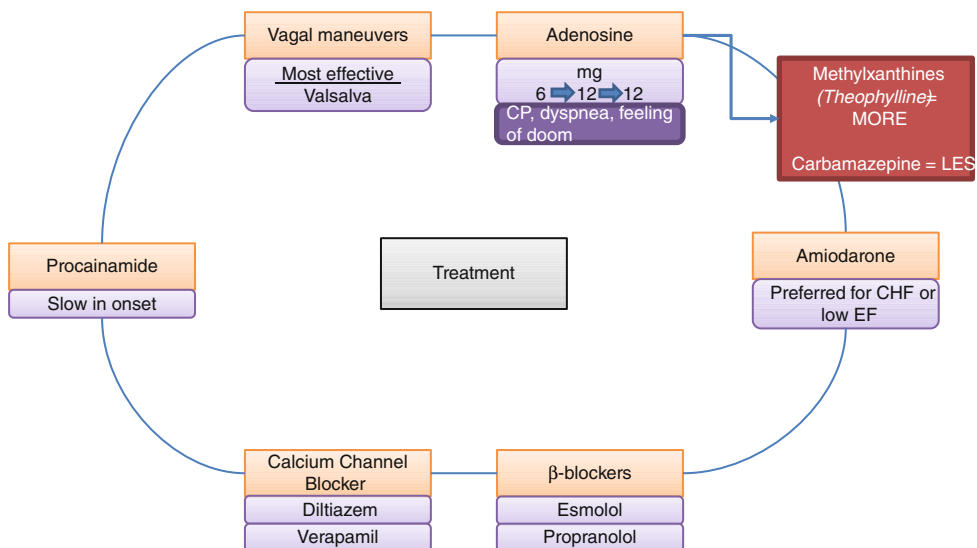
P waves	QRS Complex	T waves	ST segment	Rate
Buried in QRS or Retrograde	<u>Orthodromic</u> Normal <u>Antidromic</u> Wide ≤ 120 ms	May be inverted	Depression	200–300
<div>Orthodromic = </div> <div>Antidromic = </div>				

Atrial Fibrillation/Flutter in WPW: EKG Changes

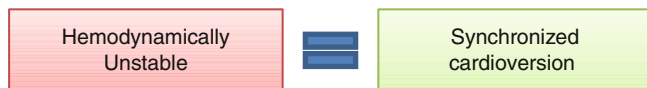
Rate	Rhythm	QRS Complex	Axis
>200 bpm	Irregular A. Flutter = Regular	Wide May change in shape	Stable



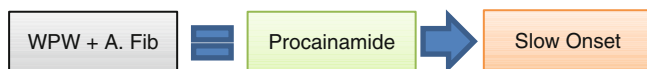
WPW Treatment: Narrow QRS Complex: Stable



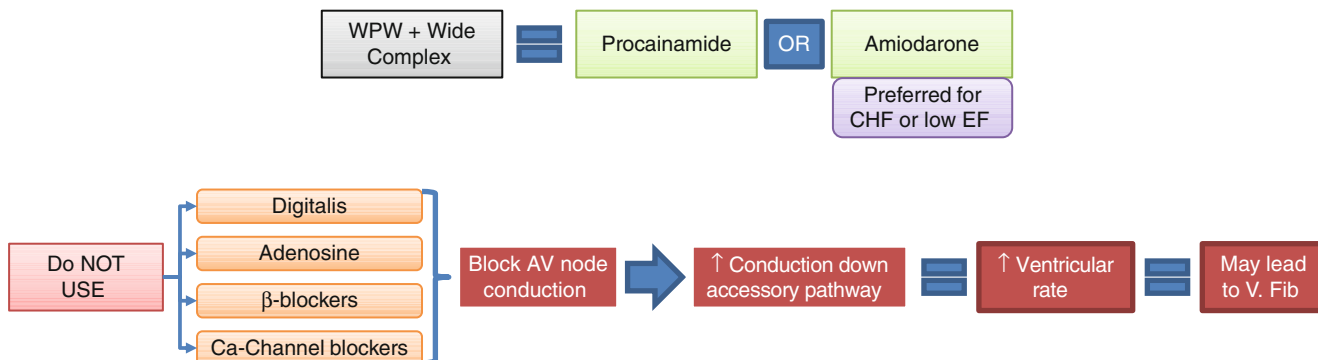
WPW Treatment: Unstable: Any Size QRS Complex



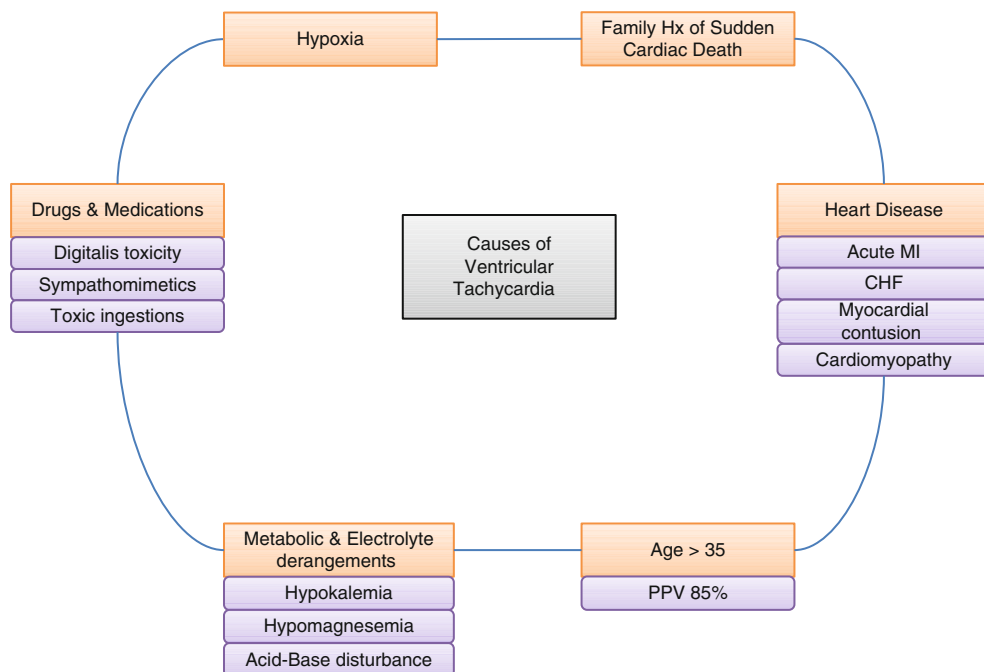
WPW Treatment Atrial Fibrillation or Flutter: Stable



WPW Treatment Wide QRS Complex: Stable

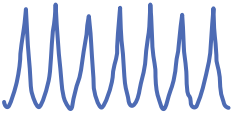



Ventricular Tachycardia (VT)

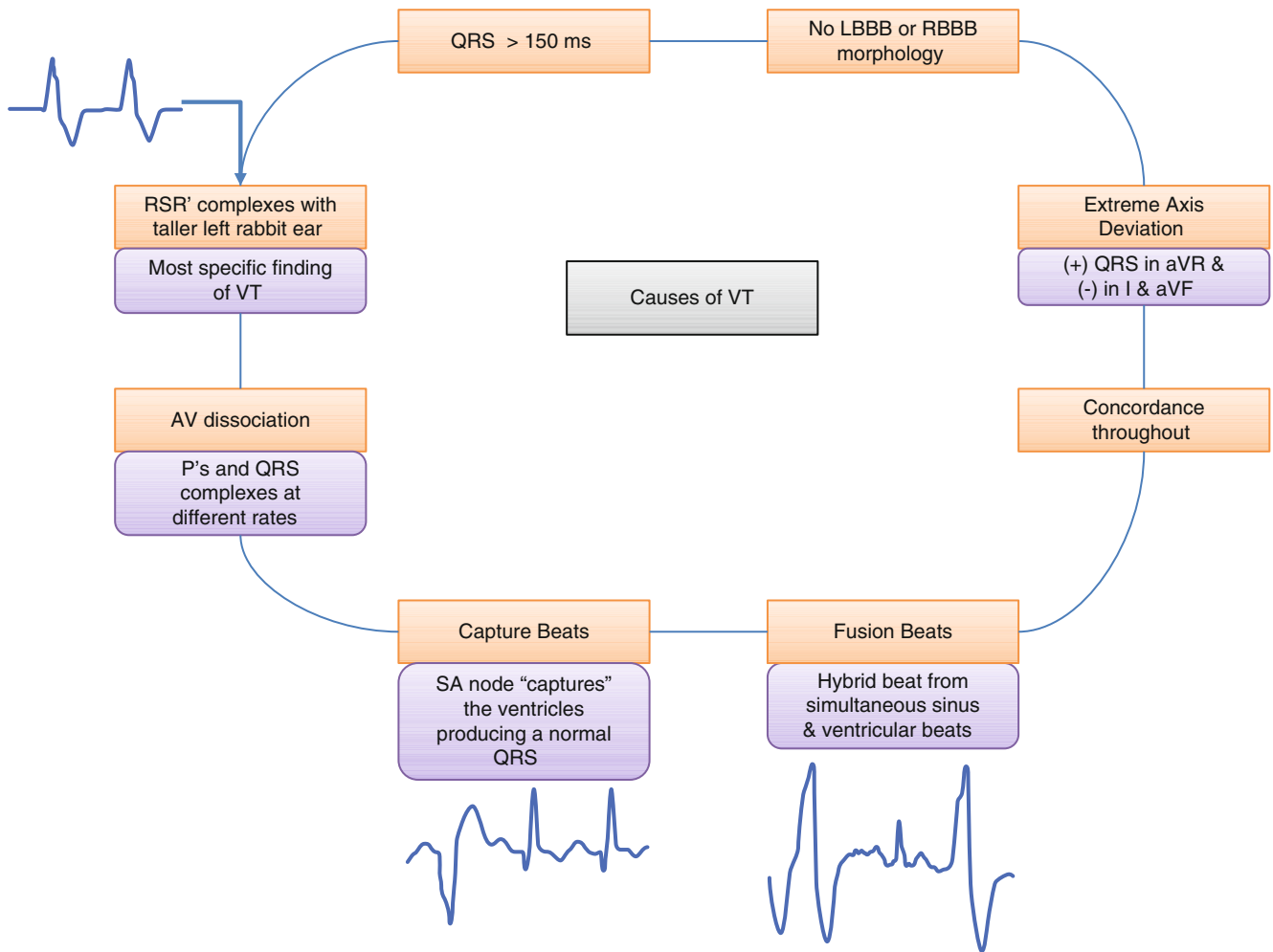


Ventricular Tachycardia: EKG Changes

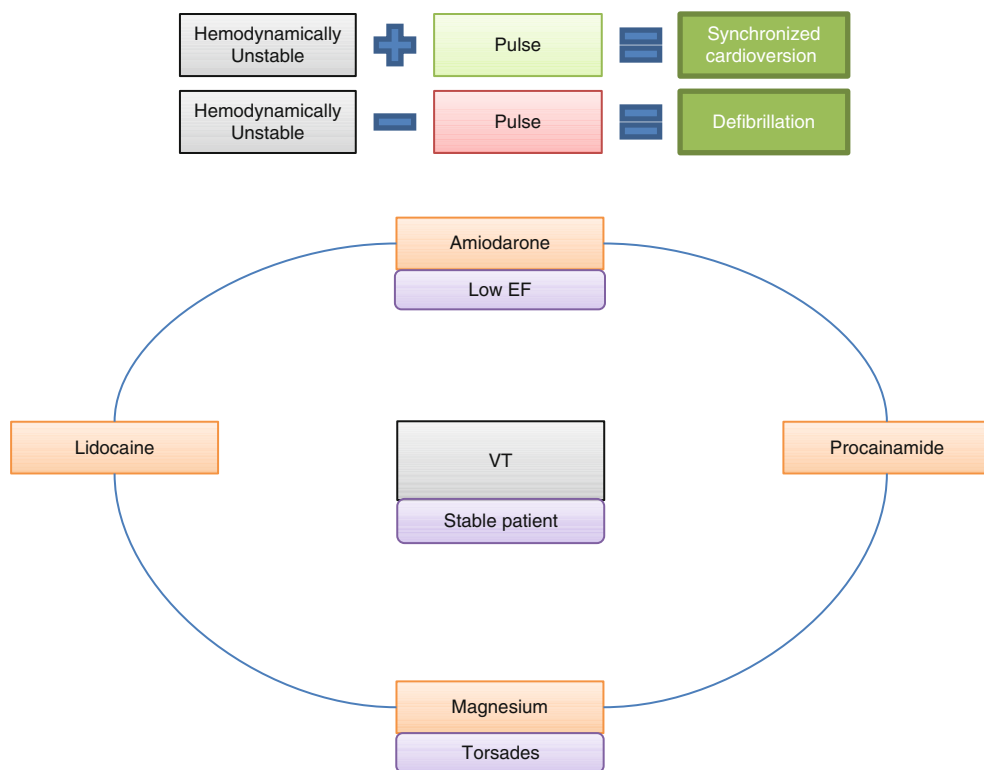
P waves	QRS Complex	Rhythm	Rate
Absent	Wide	Regular	Rate >120 Usually > 150 Unifocal or Multifocal
Monomorphic VT		Polymorphic VT	
The same QRS complexes within each lead		Example: Torsades	

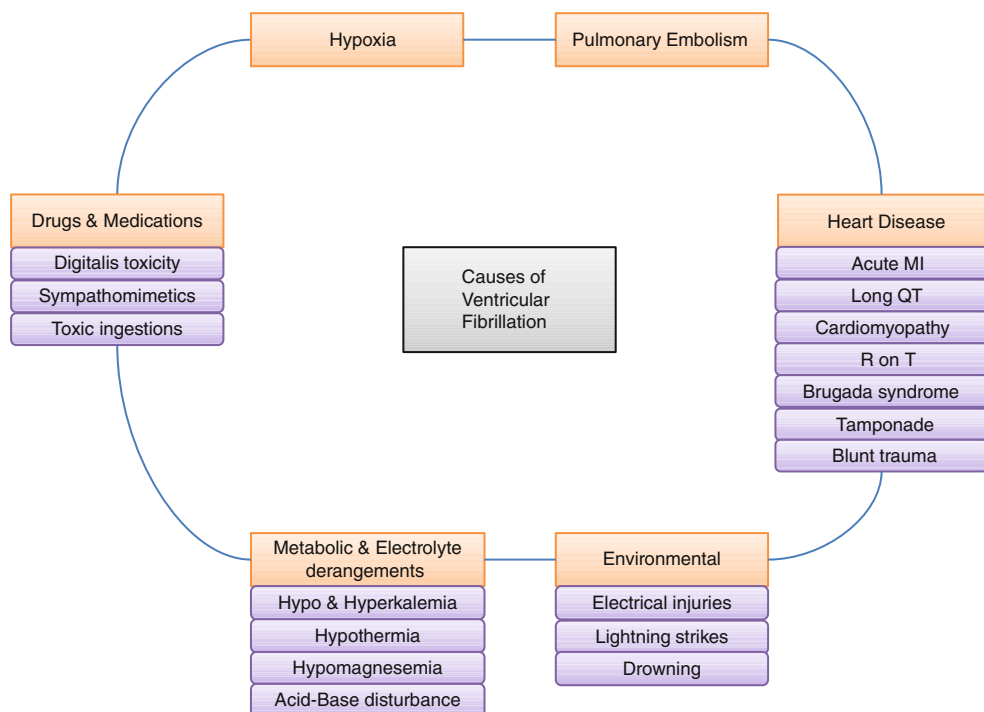
Other EKG Features of VT



VT Treatment




Ventricular Fibrillation (VF)



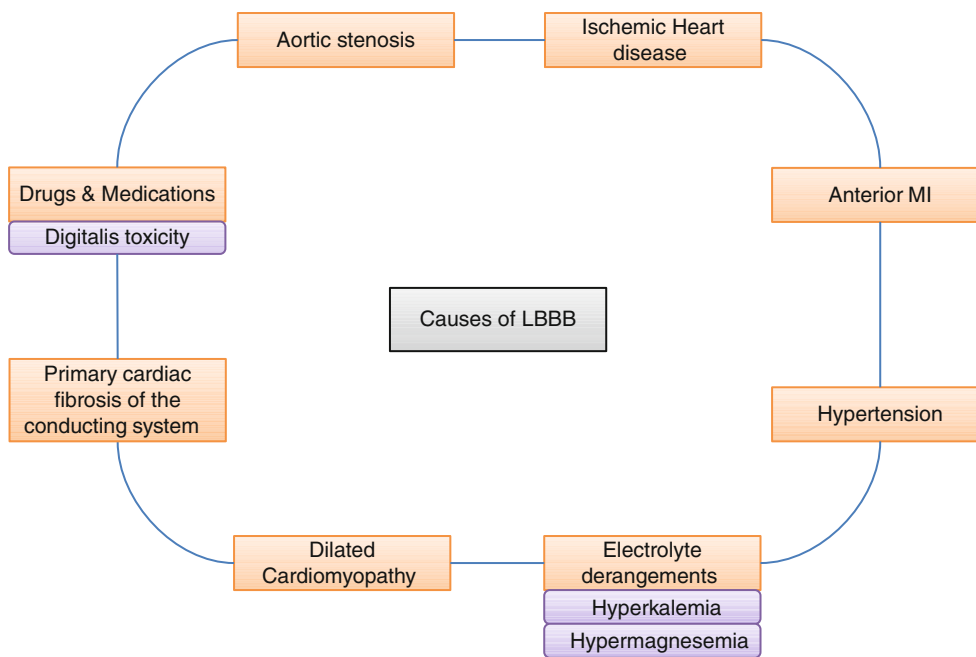
Ventricular Fibrillation: EKG Changes

P waves	QRS Complex	T waves	Rhythm	Rate
Absent	Absent	Absent	Chaotic	150–500 per minute
Other				
Amplitude decreases with duration				
Coarse to Fine				



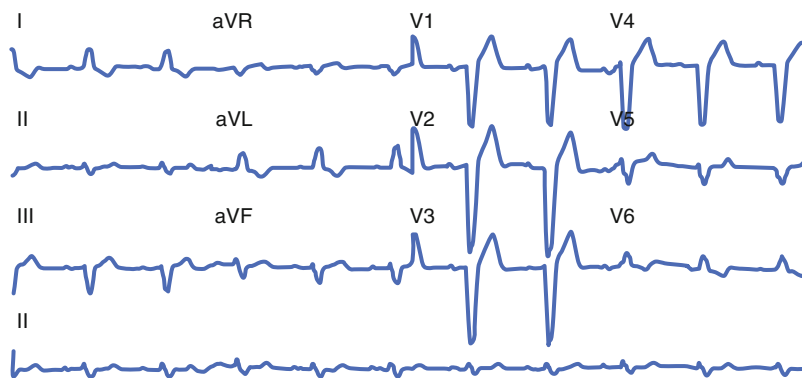
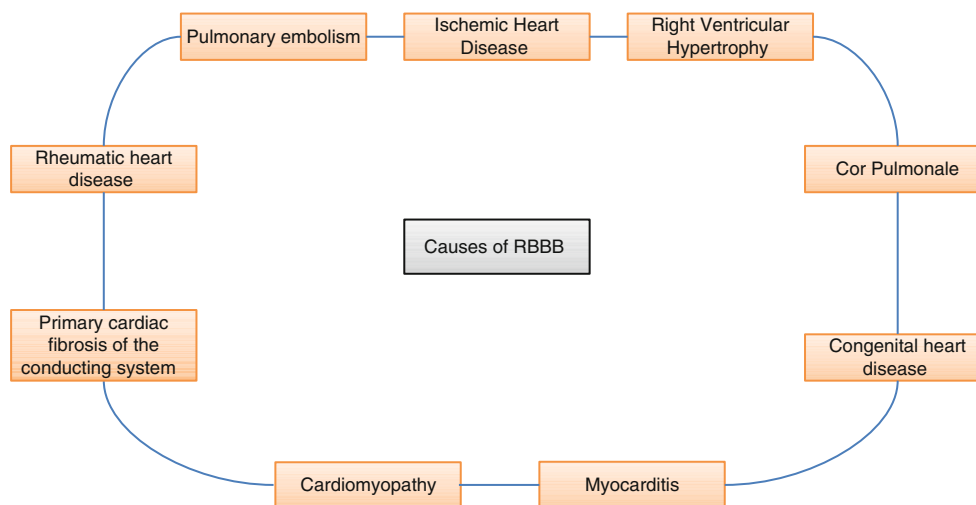
Heart Blocks

Left Bundle Branch Block (LBBB)



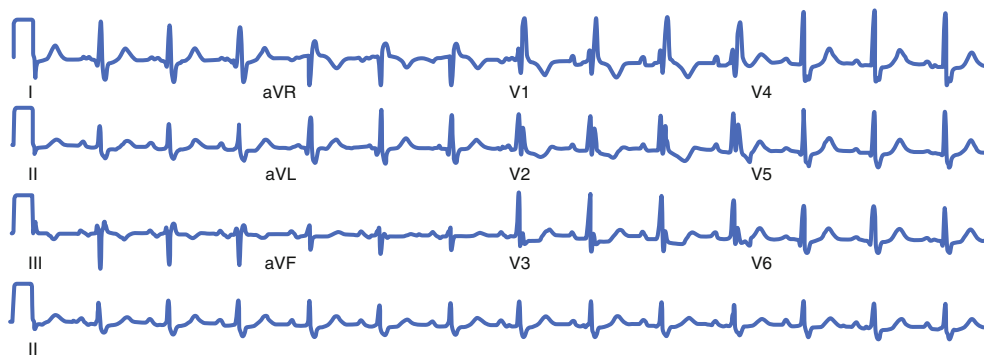
LBBB: EKG Changes

V1	Lateral leads	QRS	T waves	Other
Dominant S wave (QS or rS)	Large R waves (I, aVL, V5, V6) No Q Waves (I, V5, V6)	Wide ≥120 ms	Opposite deflection than terminal half of the QRS	Left axis deviation is common

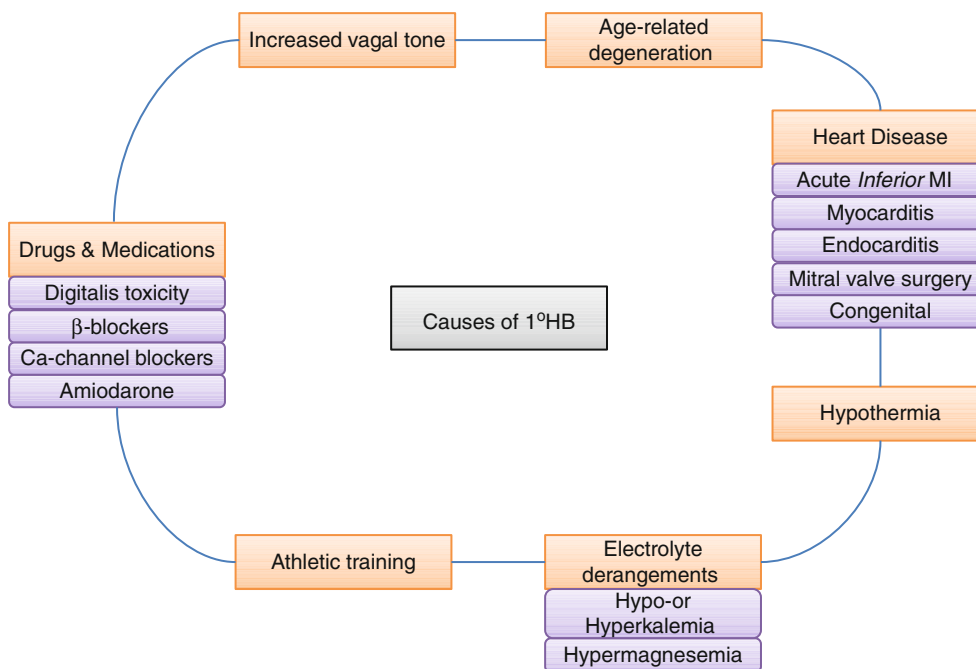
**Right Bundle Branch Block (RBBB)**

RBBB: EKG Changes

V1	Lateral leads	QRS	T waves	Other
Triphasic QRS (RSR')	Wide S waves I, V5, V6 Normal septal Q waves I, V6	Wide ≥ 120 ms	Opposite deflection than terminal half of the QRS	Axis is variable ST depression & T wave inversions V1–3

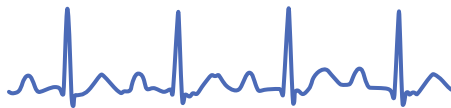
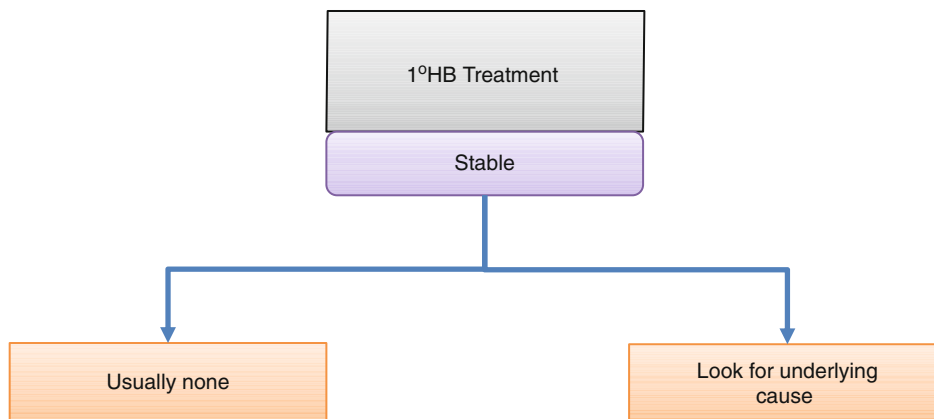
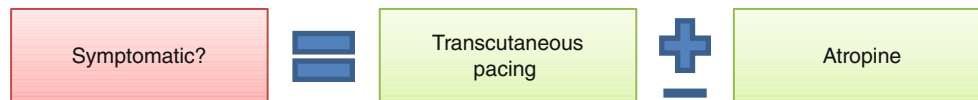


First-Degree Heart Block (1° HB)

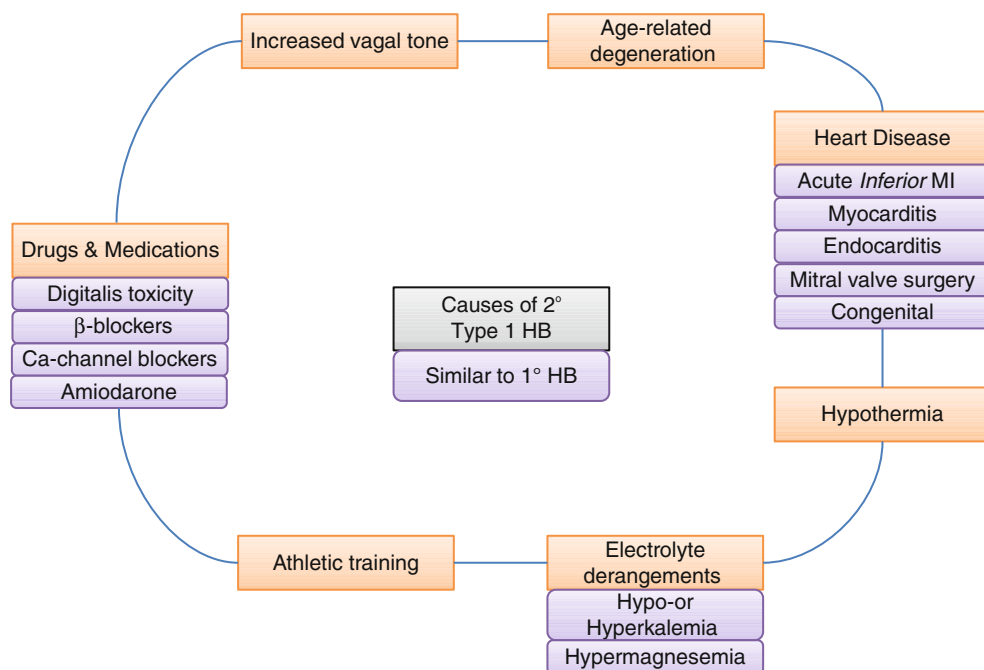


1° HB: EKG Changes

P waves	PR Interval	QRS Complex	Rhythm	Other
Normal	Prolonged > 200 ms	Usually narrow	Regular	"Marked" 1°HB if PR > 300 ms 1:1 relationship of P & QRS Block at level of AV node

**1° HB Treatment**

Second-Degree Type 1 Heart Block (2° Type 1 HB)

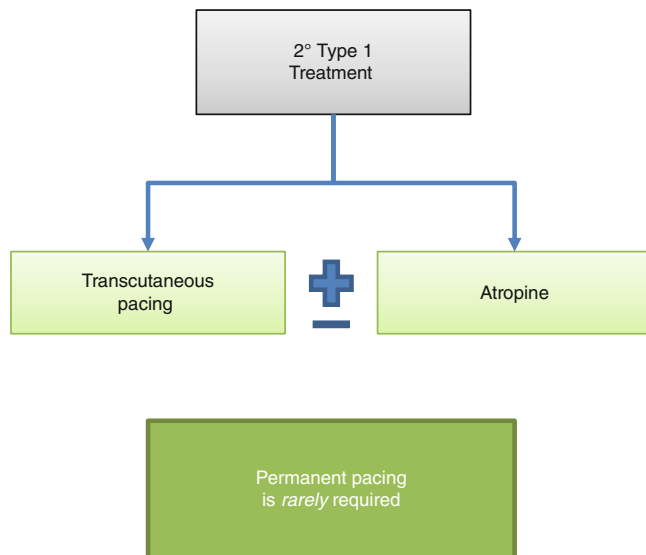


2° Type 1 HB: EKG Changes

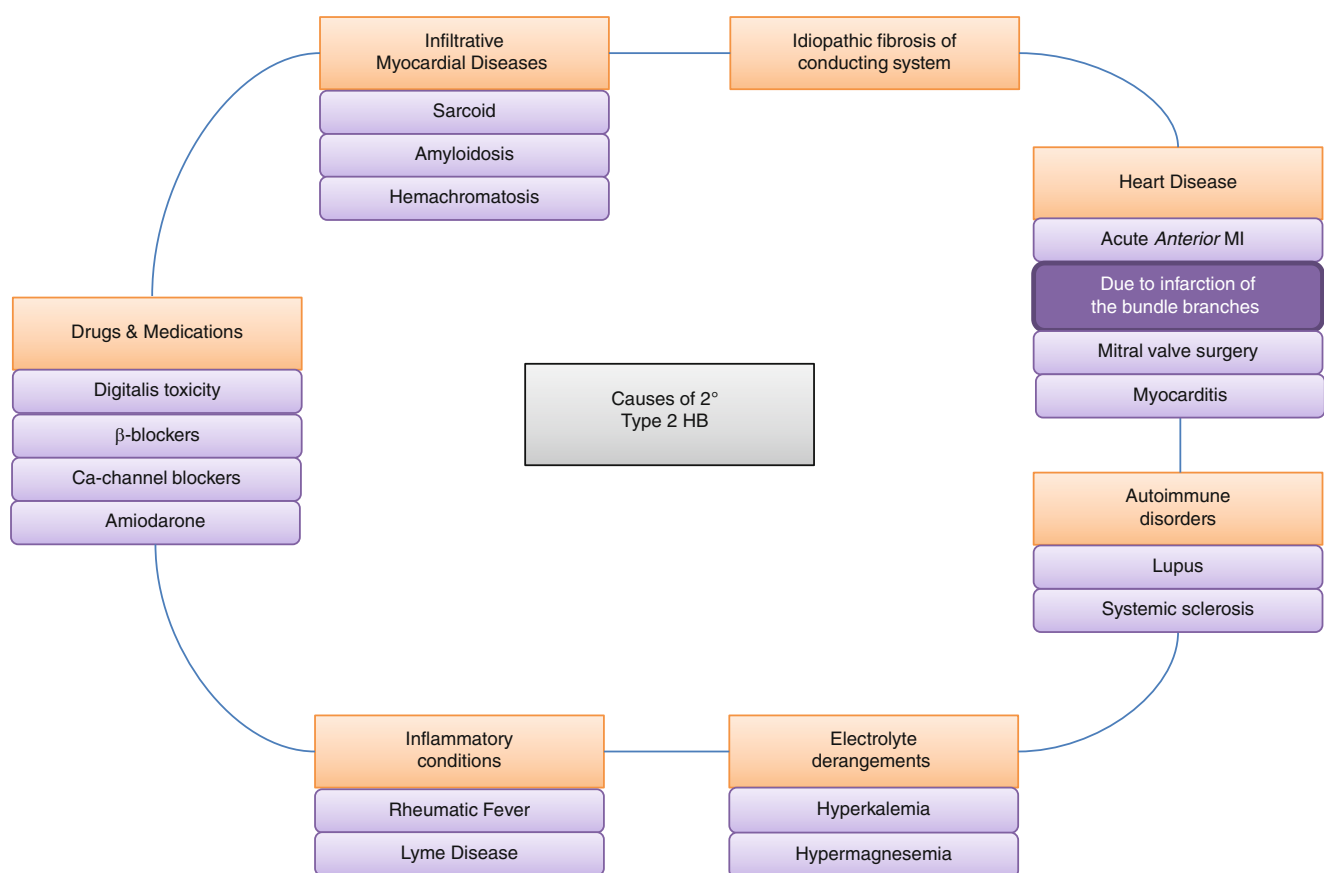
P waves	PR & RR Intervals	QRS Complex	Rhythm	Other
Normal	<p>PR Progressively lengthens</p> <p>RR Progressively shortens</p> <p>Until a beat is dropped</p>	Usually narrow	Regular	<p>"Marked" 1°HB if PR > 300 ms</p> <p>1:1 relationship of P & QRS</p> <p>Block at level of AV node</p>



2° Type 1 HB Treatment



Second-Degree Type 2 Heart Block (2° Type 2 HB)

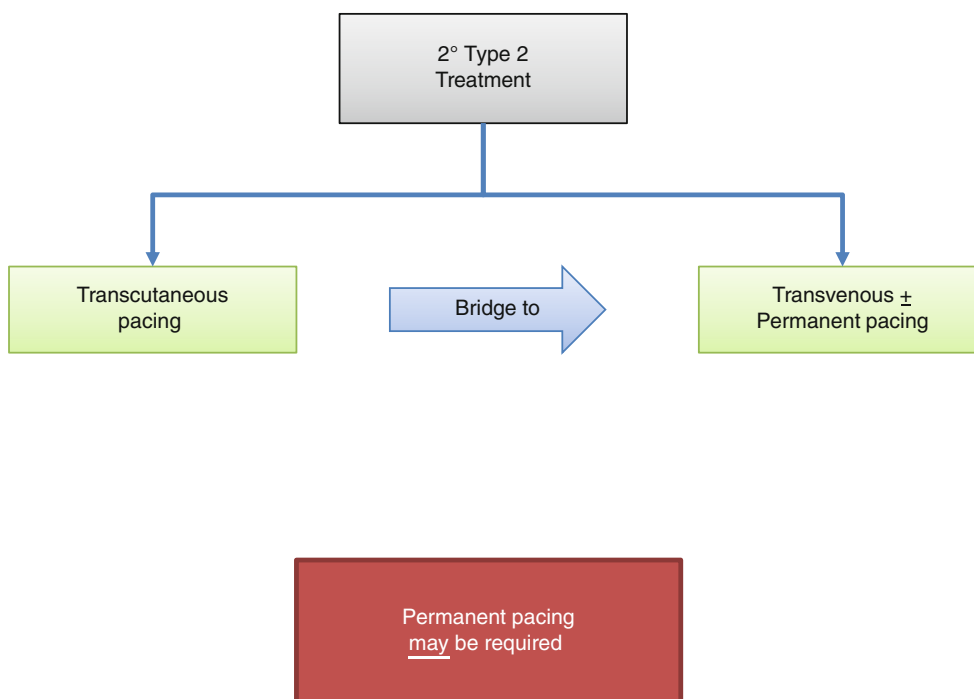


2° Type 2 HB: EKG Changes

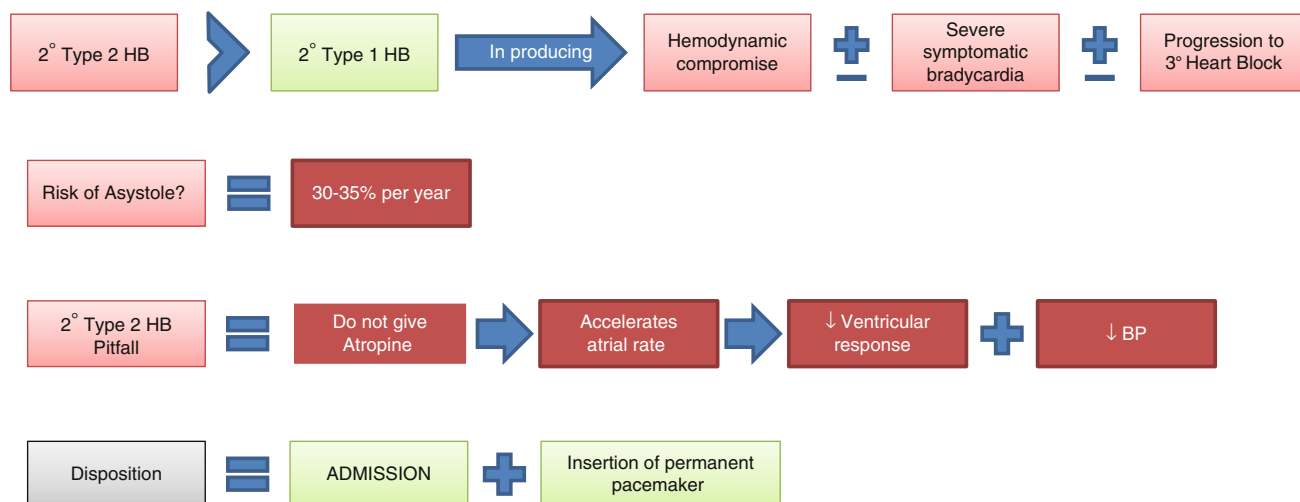
P waves	PR Intervals	QRS Complex	Dropped Beats	Other
Normal	When they occur are of the same duration	Usually wide	Present	Block below AV node Typically with pre-existing LBBB or bifascicular block



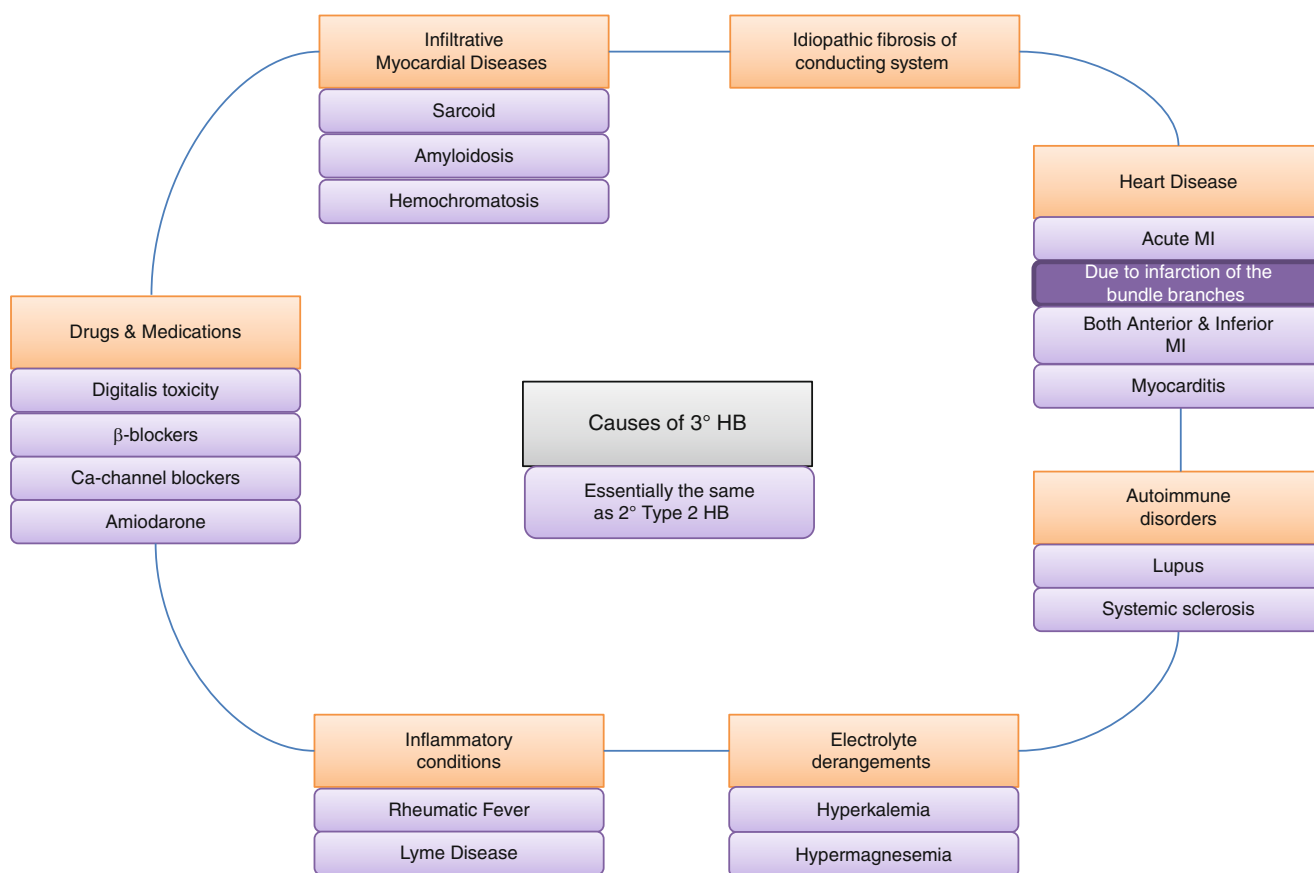
2° Type 2 HB Treatment



Other Tidbits Concerning 2° Type 2 HB

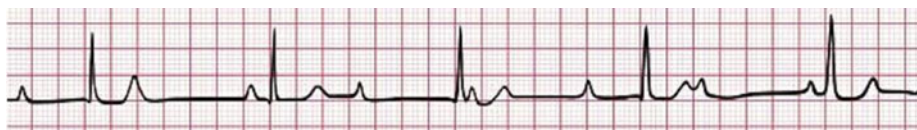


Third-Degree Heart Block (3° HB)



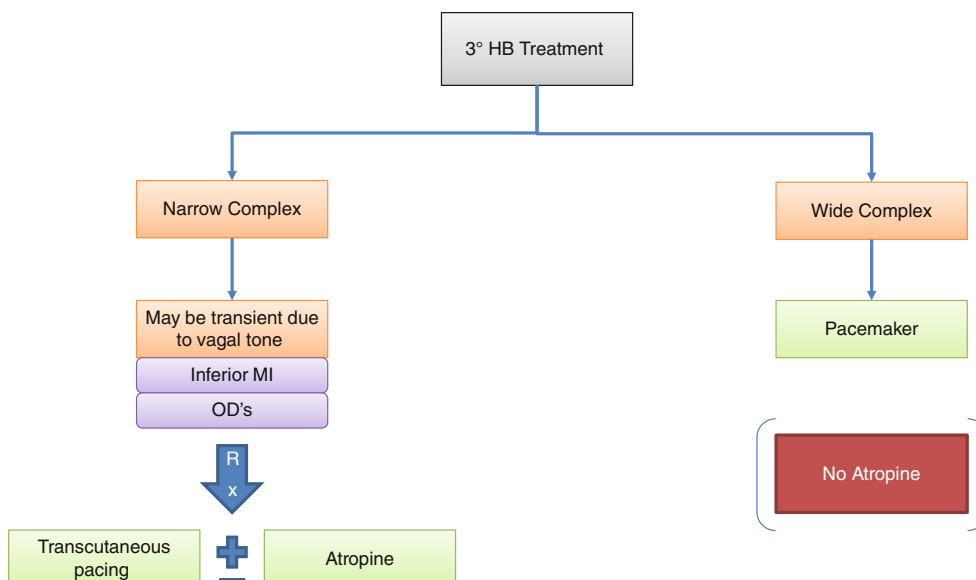
3° HB: EKG Changes

P waves	PR Intervals	QRS Complex	Rate	Other
Normal	Changes randomly	<u>Junctional escape beats</u> Narrow QRS <u>Ventricular escape beats</u> Wide QRS	Usually severe bradycardia with independent atrial & ventricular rates	Block at AV node, bundle of His or bundle branches No relationship between P and QRS



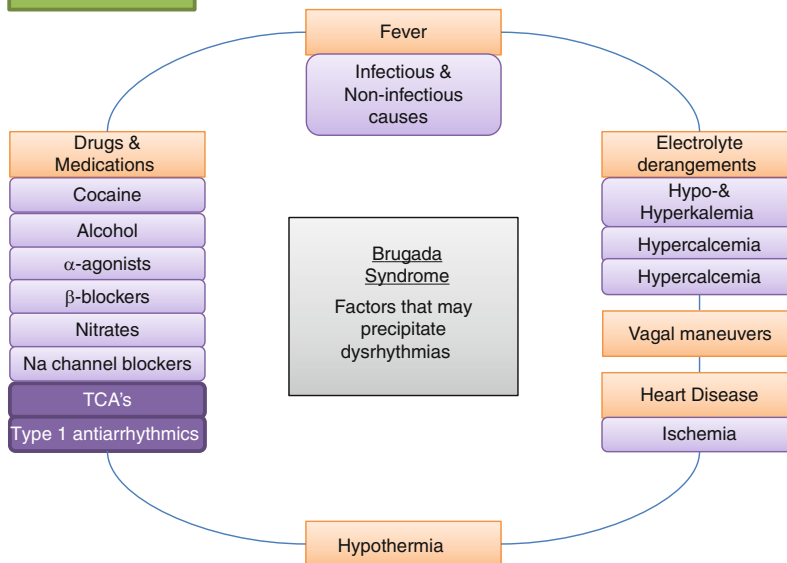
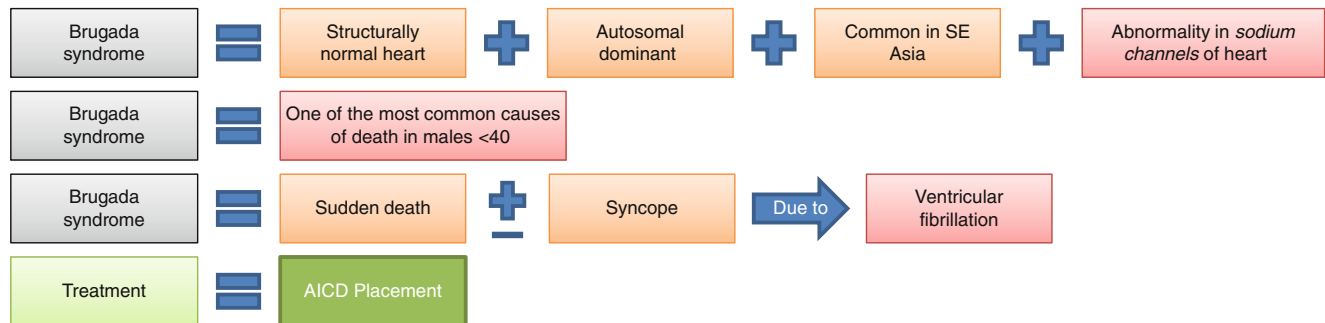
Rate	Other
Atrial rate > Ventricular rate	Fusion beats are common

3° HB Treatment


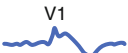


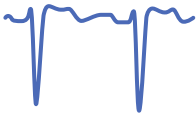
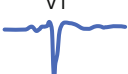








Miscellaneous

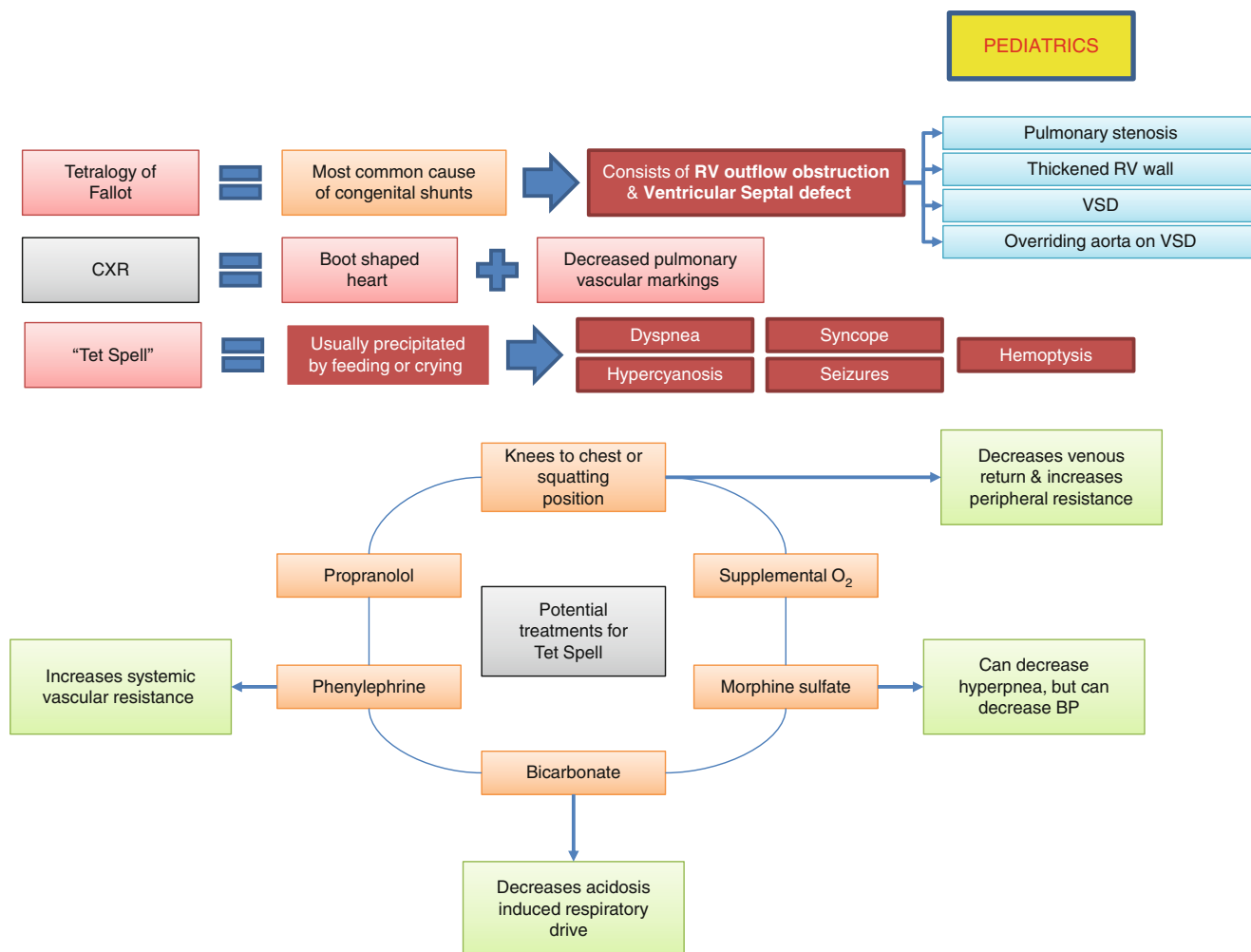
Brugada Syndrome Introduction



Brugada Syndrome: EKG Changes

ST segments	Brugada Sign Type 1	Type 2	Type 3
Elevated in V1 & V2	Coved ST segment elevation > 2mm in V1-3 (only need 1 lead) followed by a (-) T wave "Pseudo RBBB"	ST elevation resembling a saddle > 2mm	Morphology of Type 1 or 2, but <2 mm ST elevation
	 Type 1 V1  V2  V3 	 Type 2 V1  V2  V3 	 Type 3 V1  V2  V3 

Tetralogy of Fallot



Pulmonary Emergencies

Michael R. Marchick and Bobby Desai

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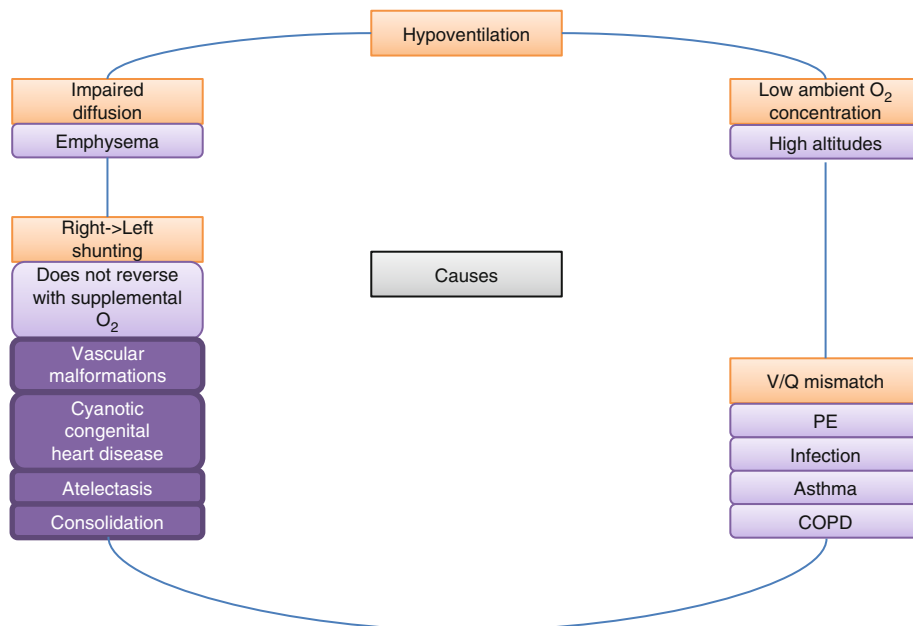
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M.R. Marchick, MD
Department of Emergency Medicine,
University of Florida College of Medicine,
Gainesville, FL, USA

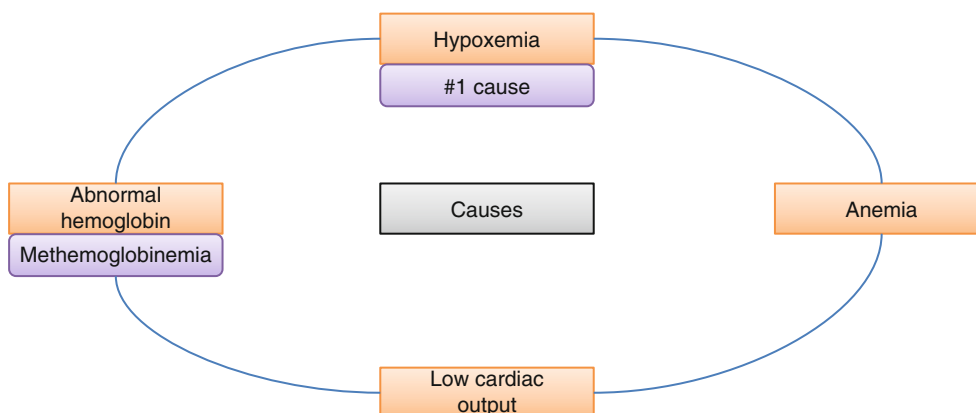
B. Desai, MD, MEd (✉)
Department of Emergency Medicine,
University of Florida, Gainesville, FL, USA
e-mail: bdesai@ufl.edu

Definitions and Clinical Presentations

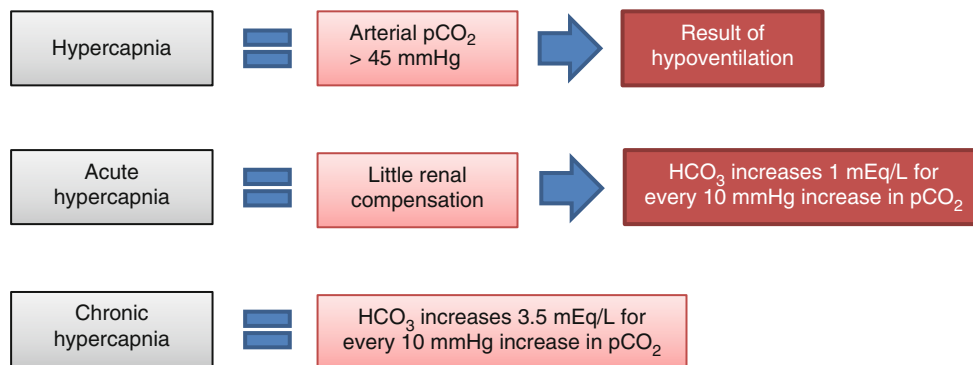
Hypoxemia



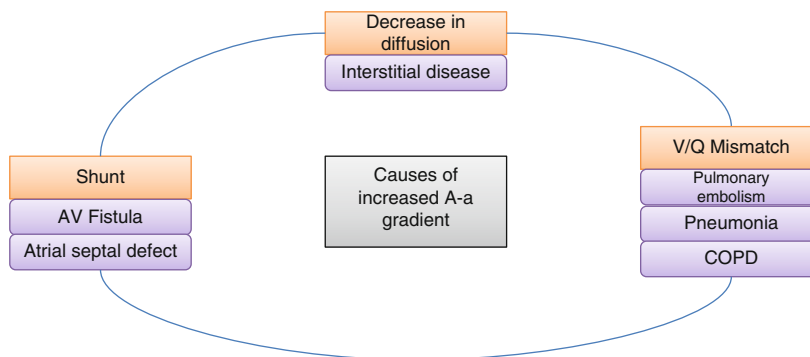
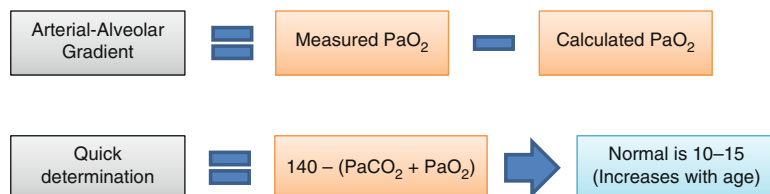
Hypoxia



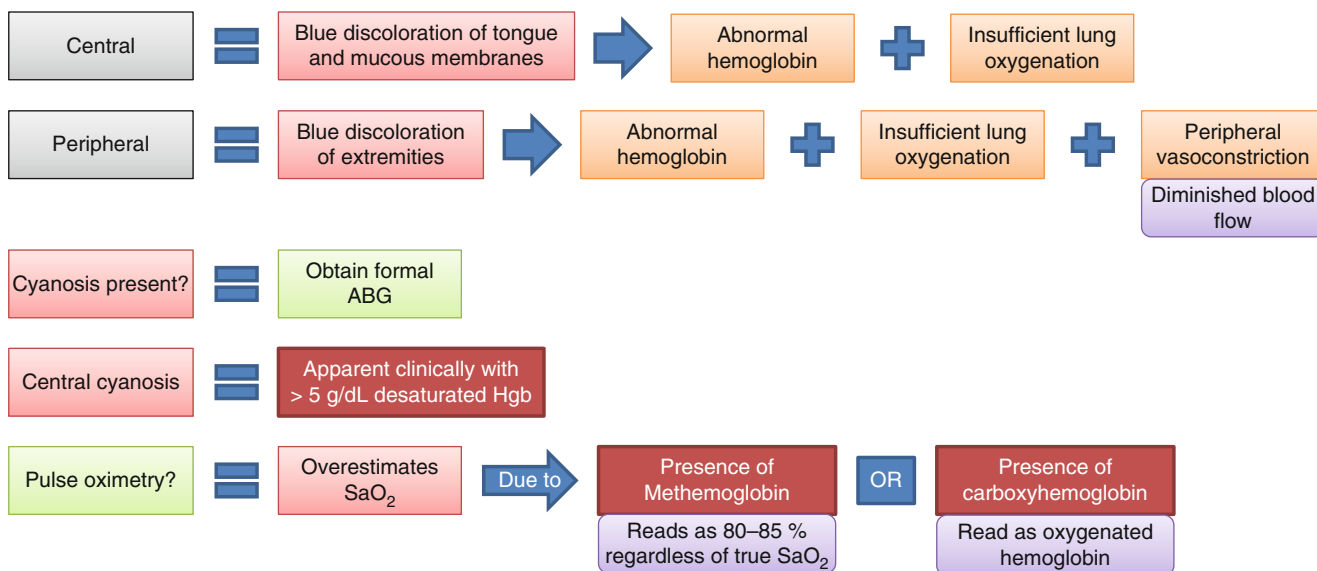
Hypercapnia



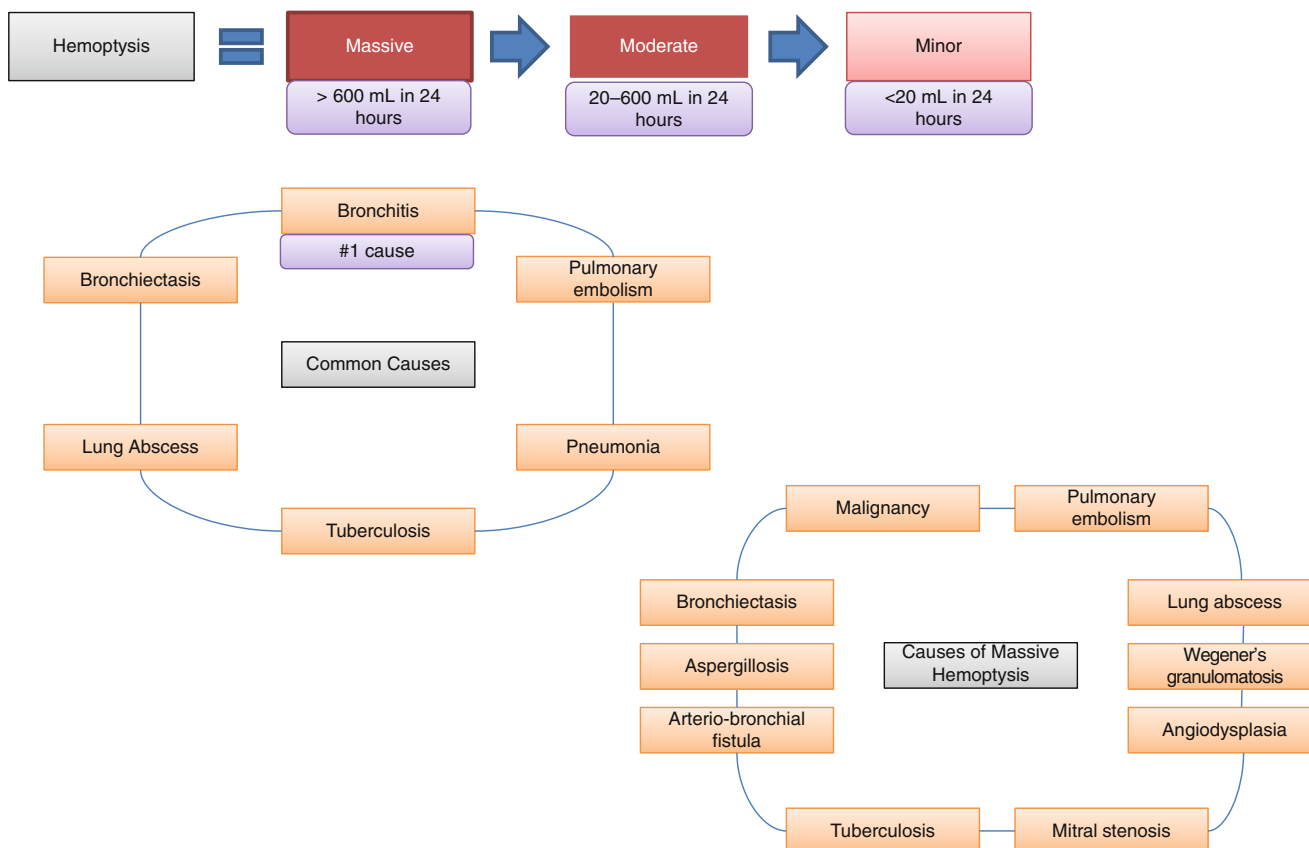
Arterial-Alveolar Gradient

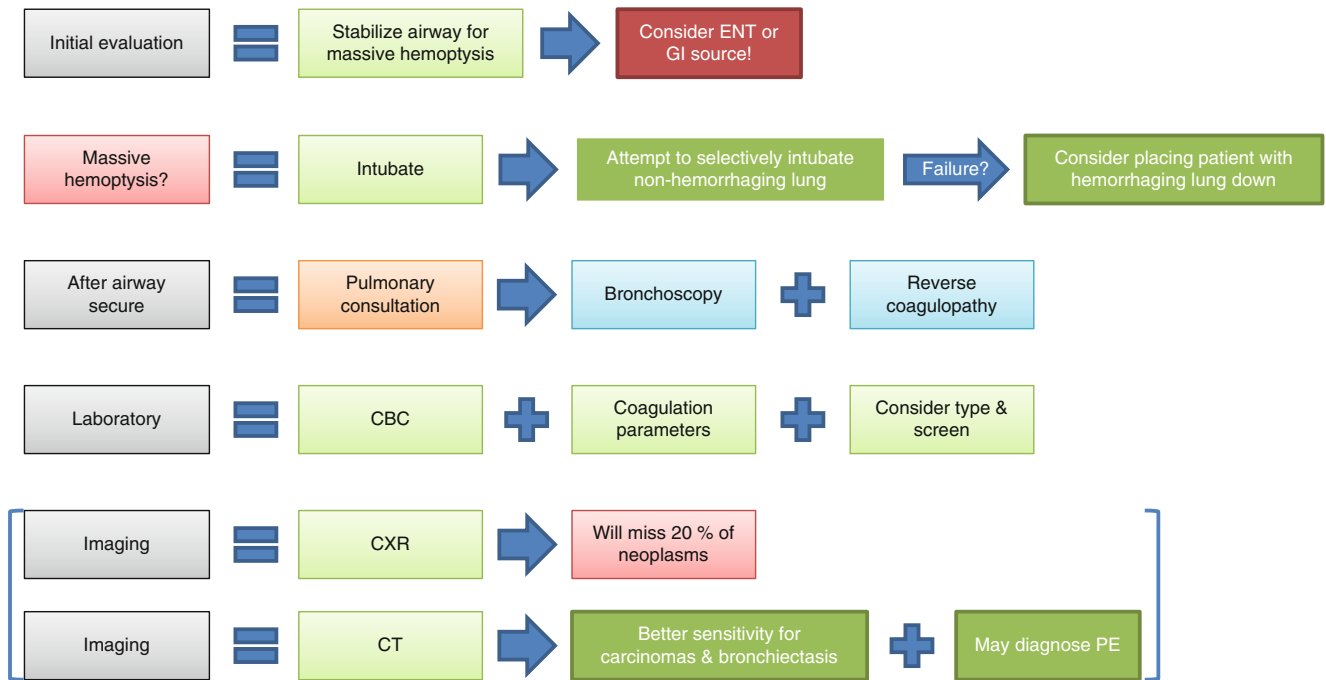


Cyanosis



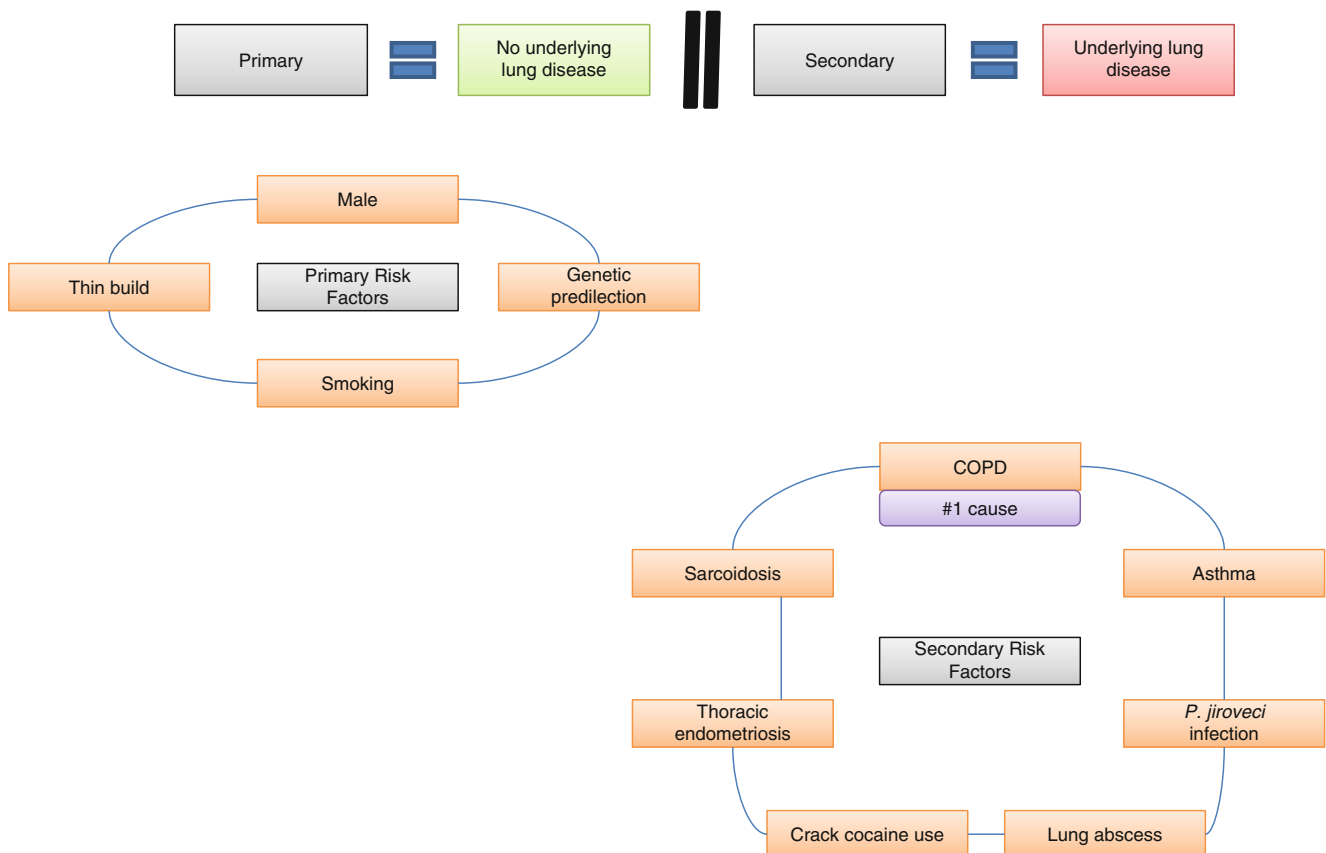
Hemoptysis



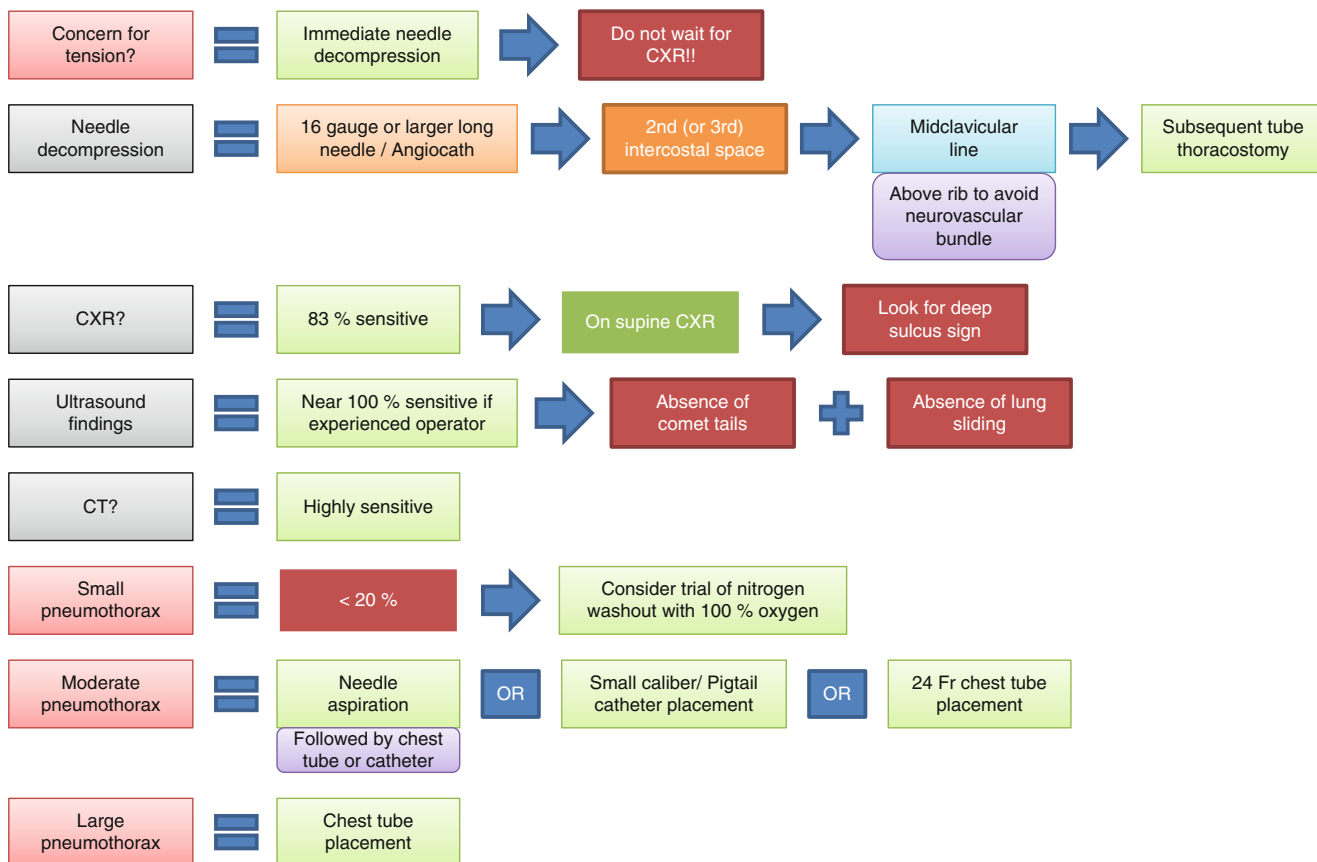


Pneumothorax

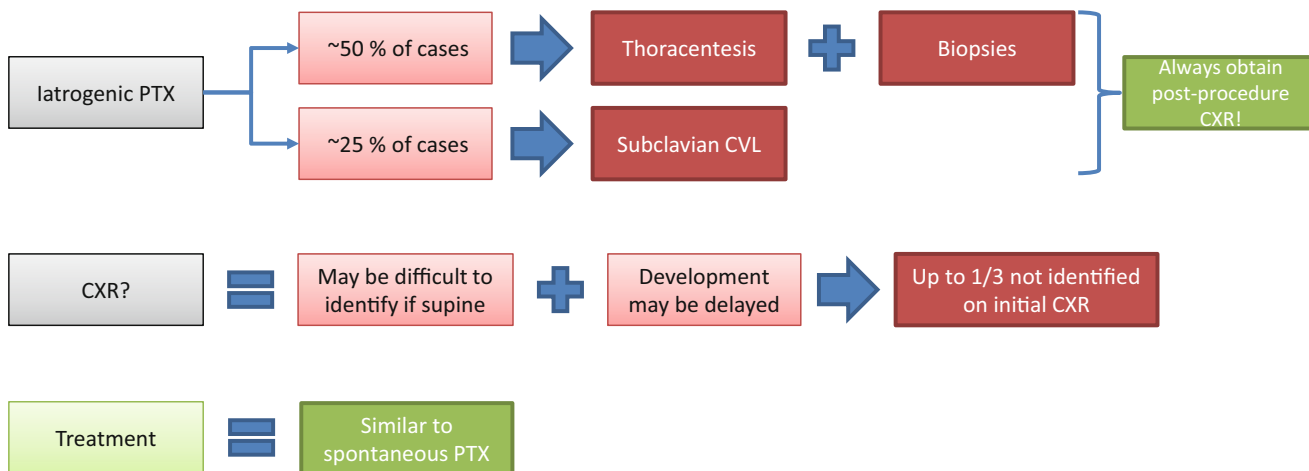
Spontaneous Pneumothorax



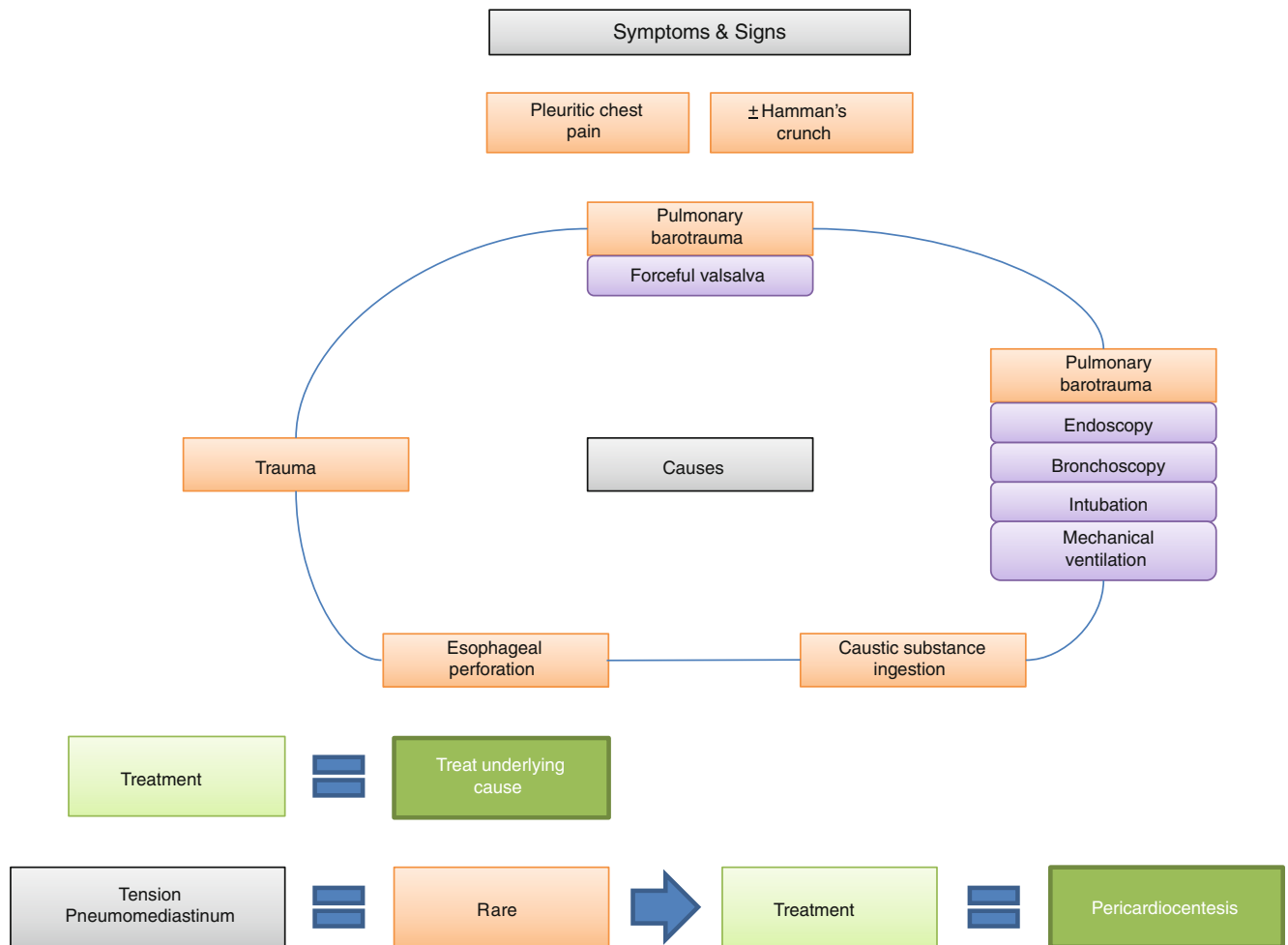
Pneumothorax Diagnosis and Management



Iatrogenic PTX

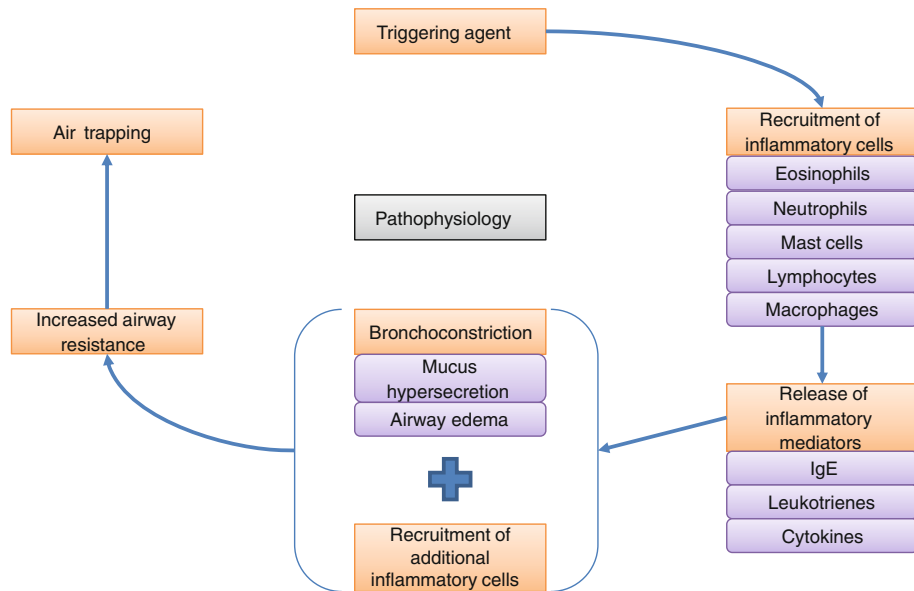
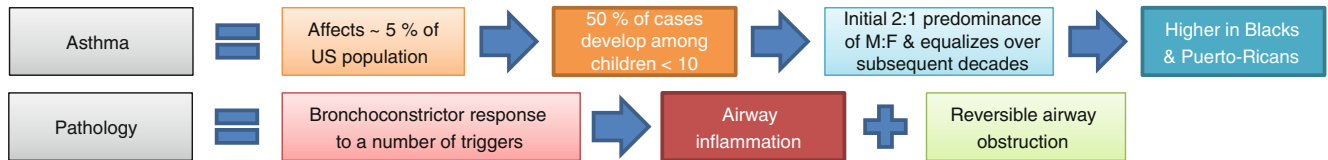


Pneumomediastinum

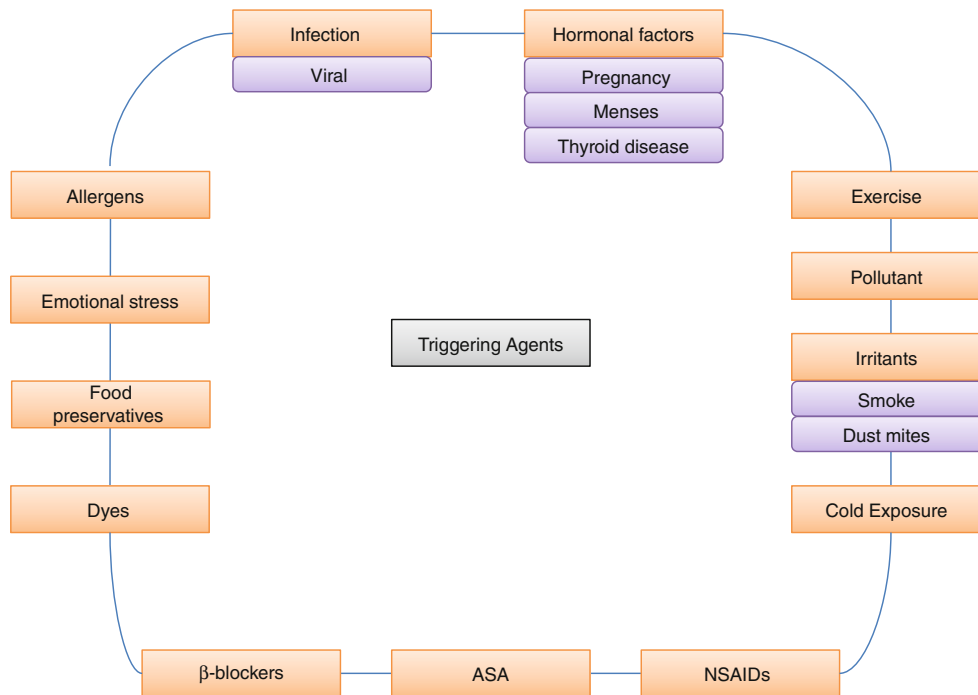


Asthma

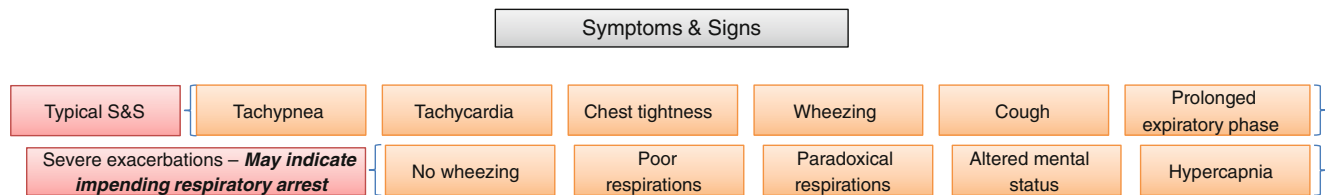
Introduction



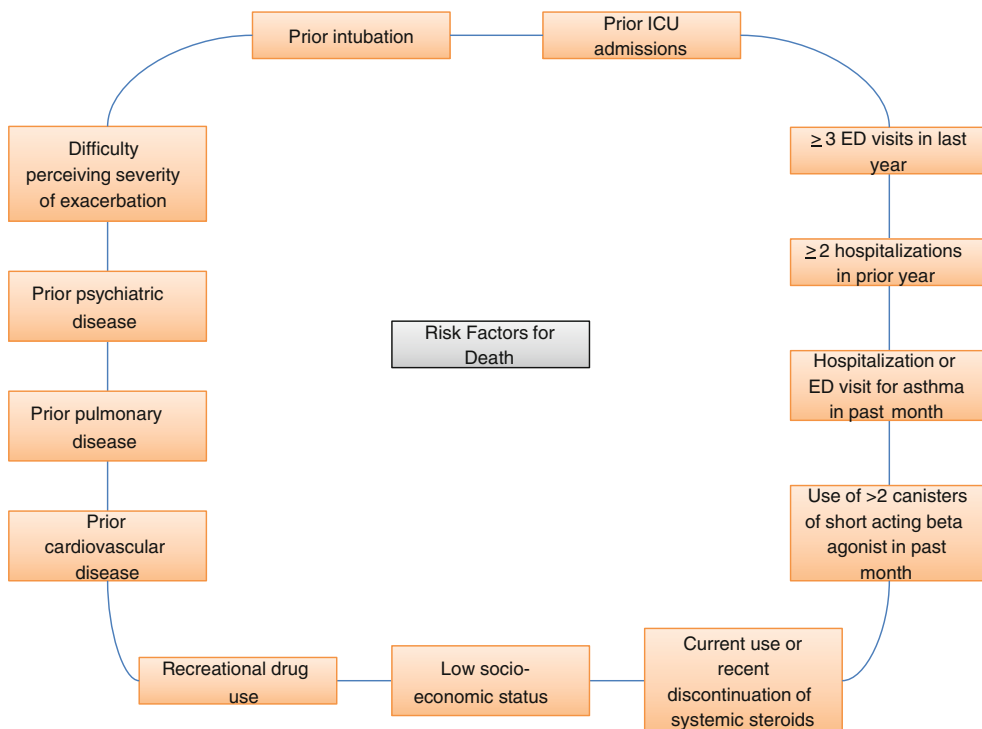
Triggering Agents



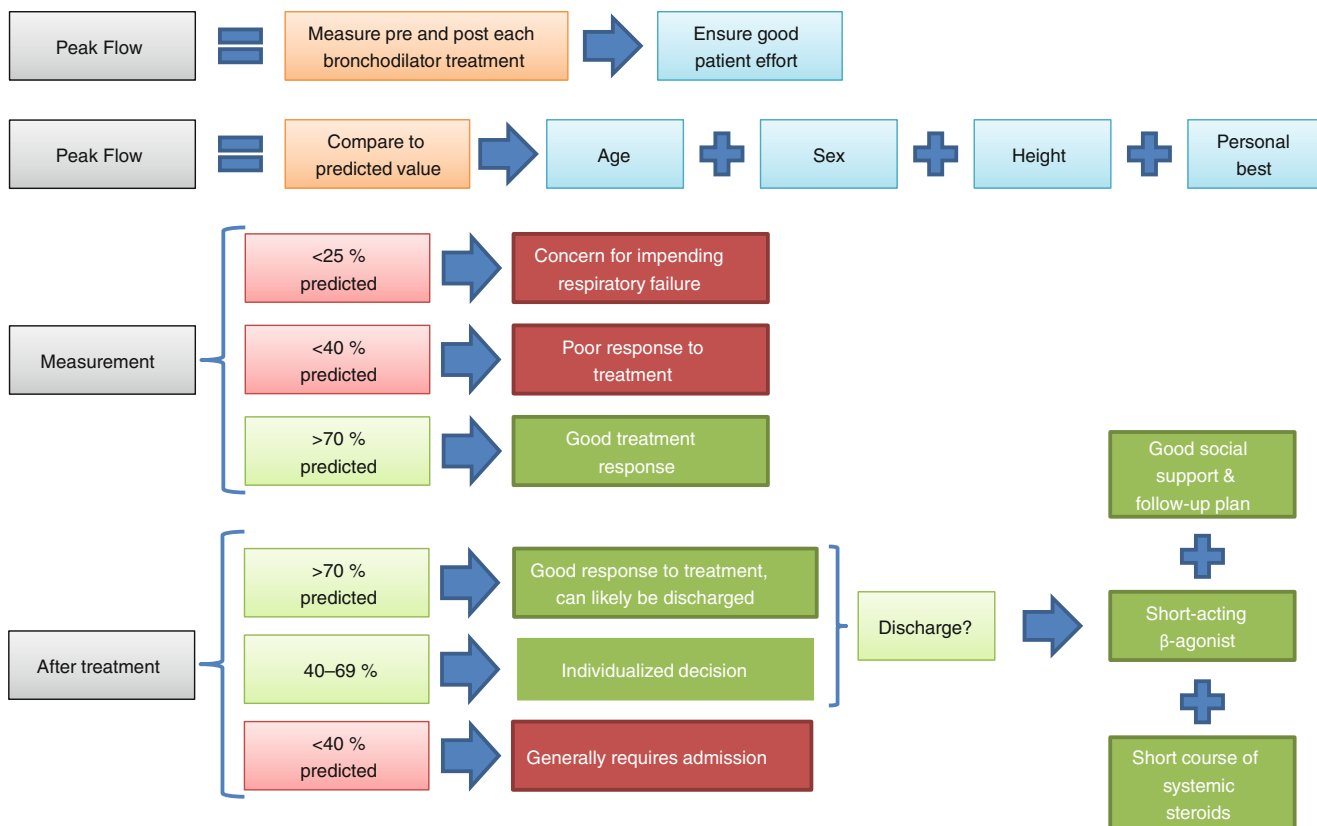
Clinical Features



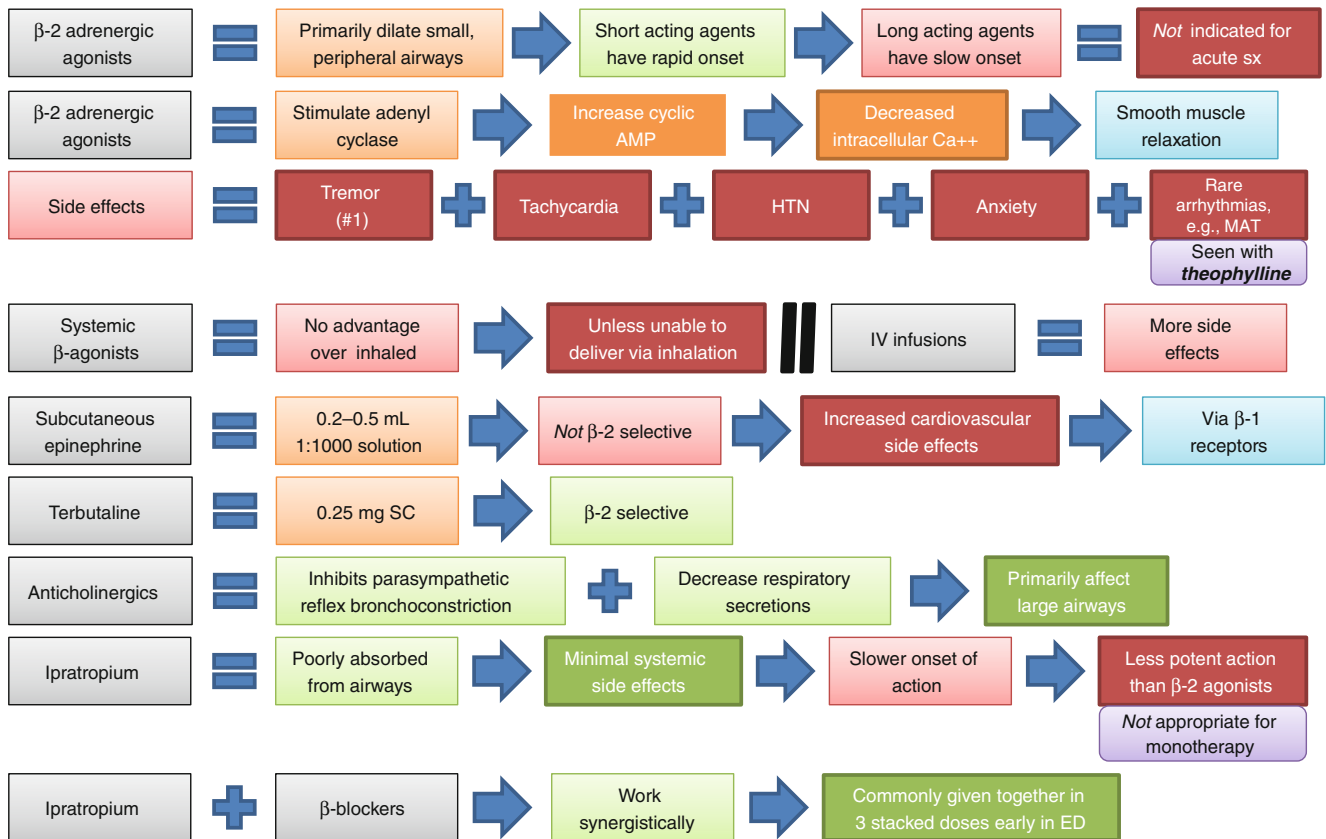
Risk Factors for Death



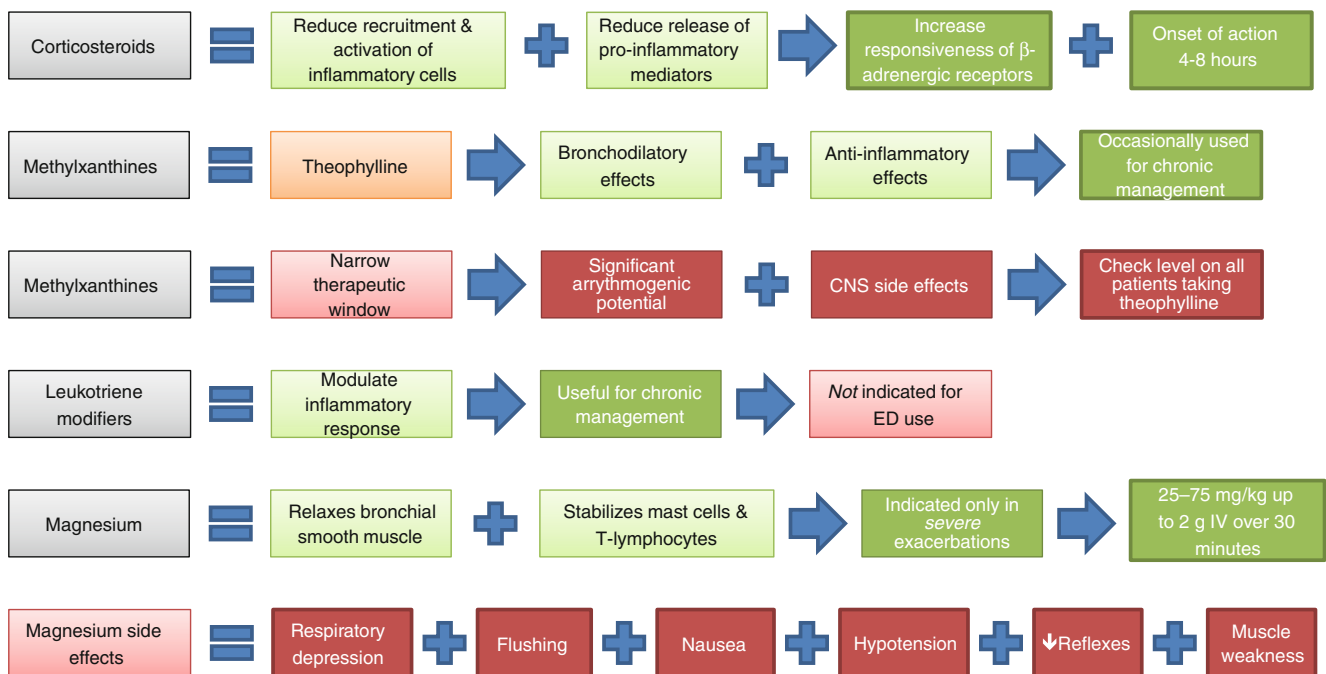
Peak Flow



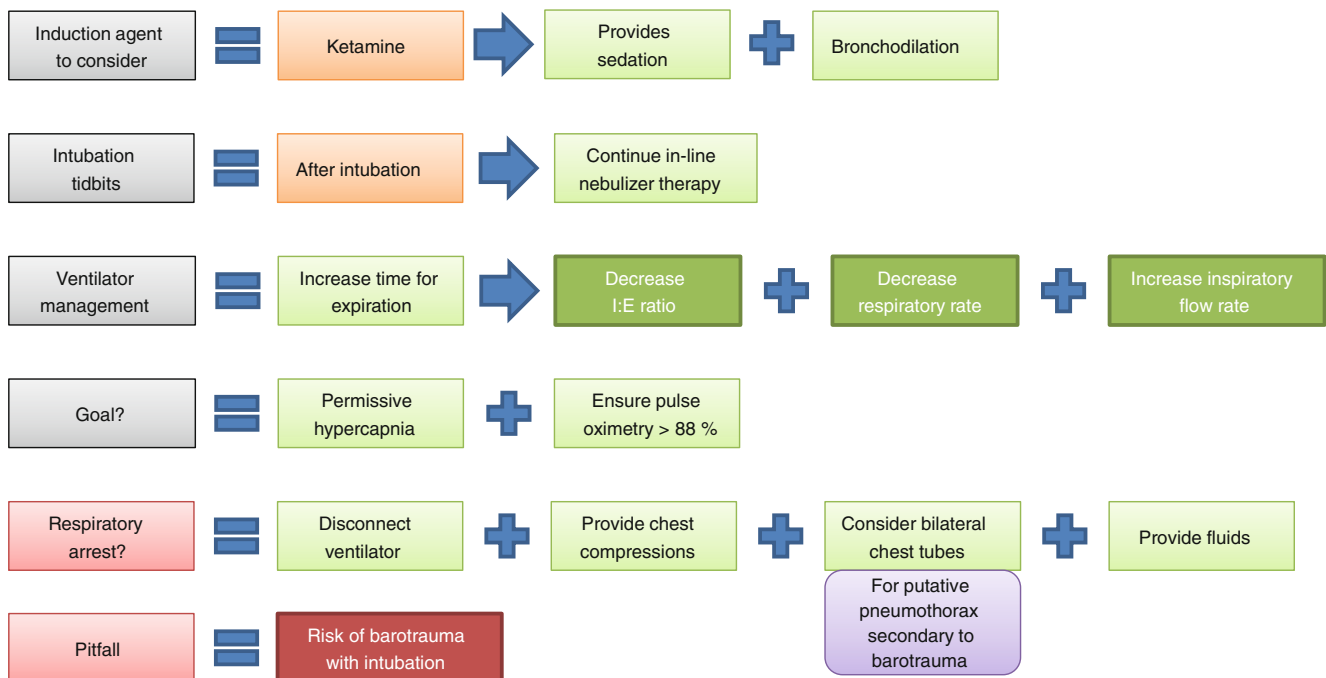
β-Agonists and Anticholinergics



Steroids, Methylxanthines, Magnesium, and Leukotriene Modifiers

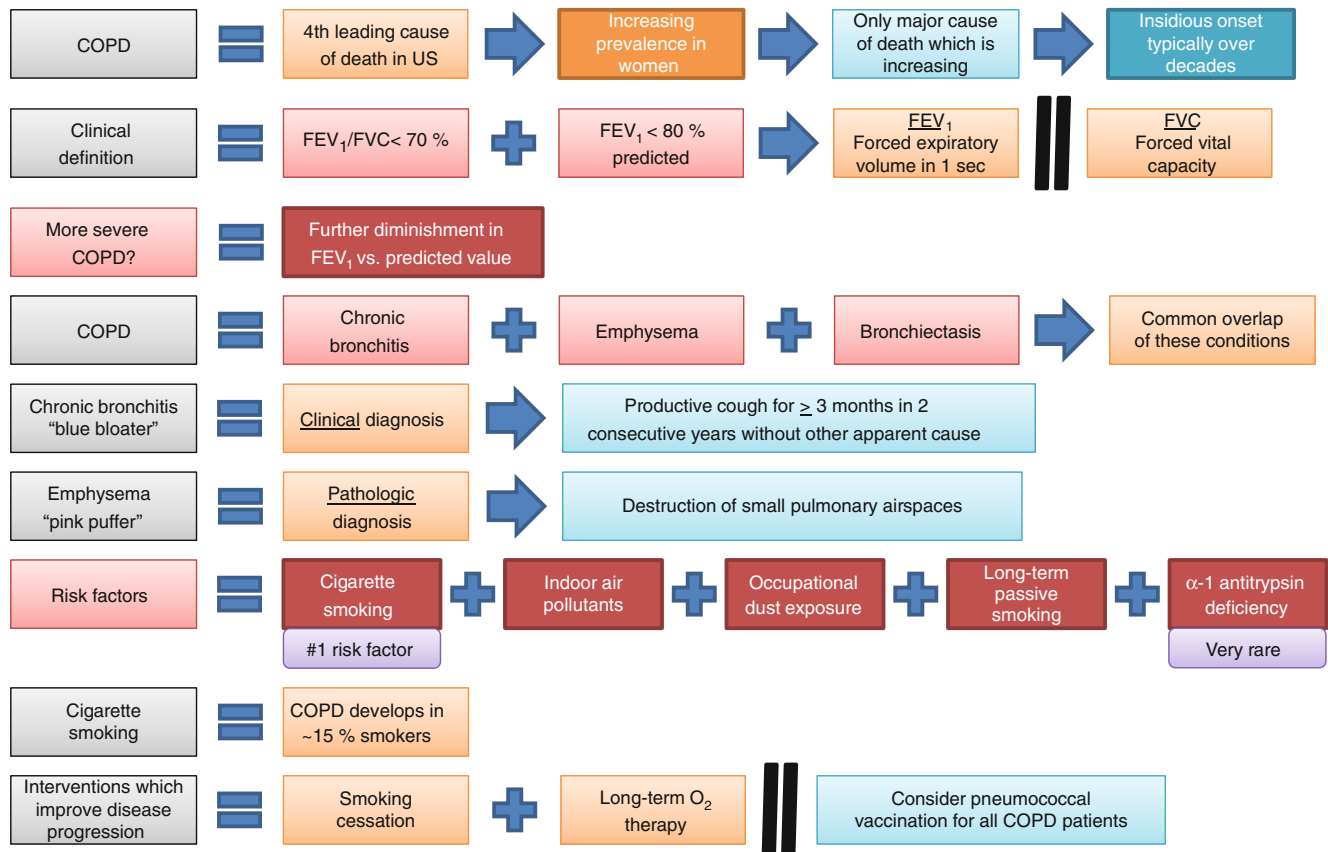


Severe Asthma Management

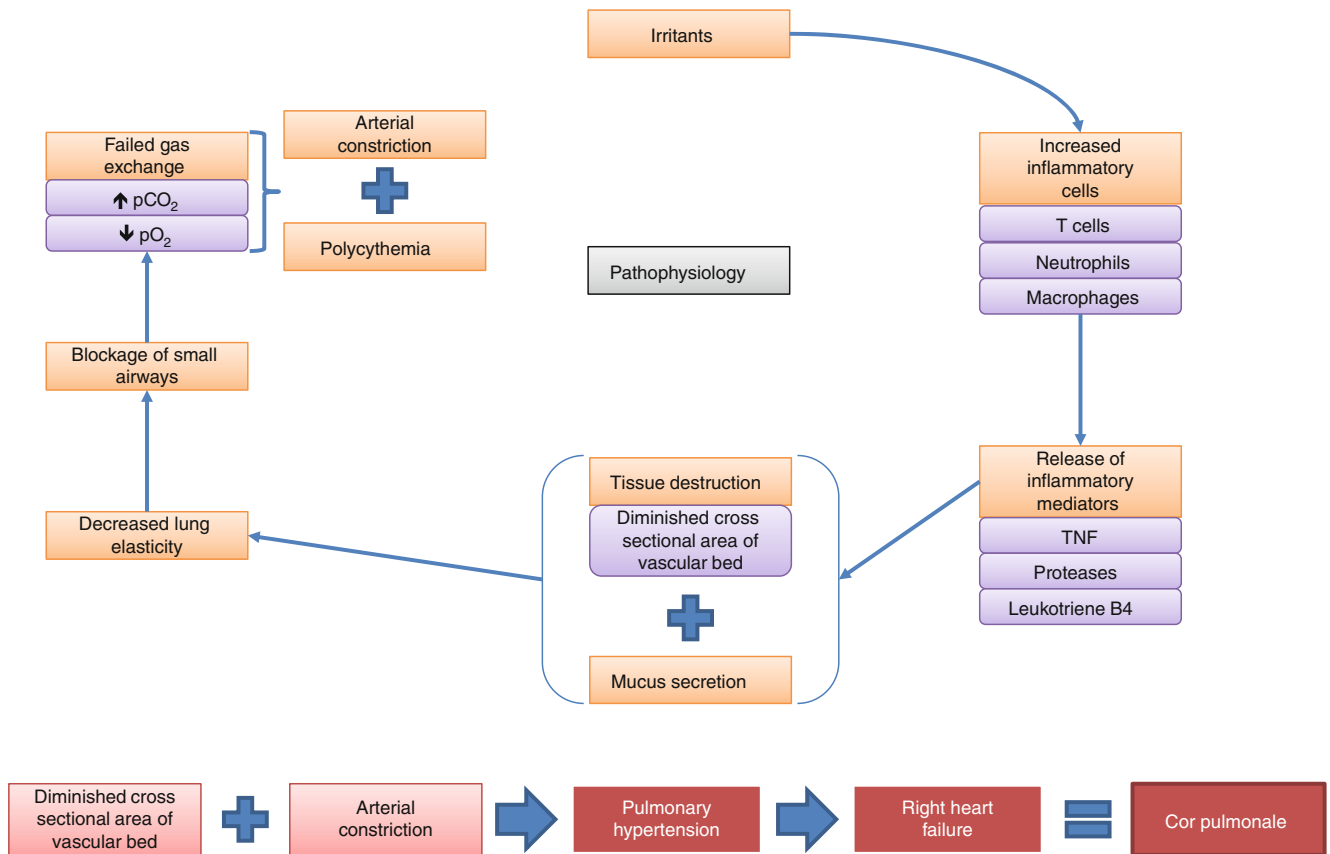


Chronic Obstructive Pulmonary Disease

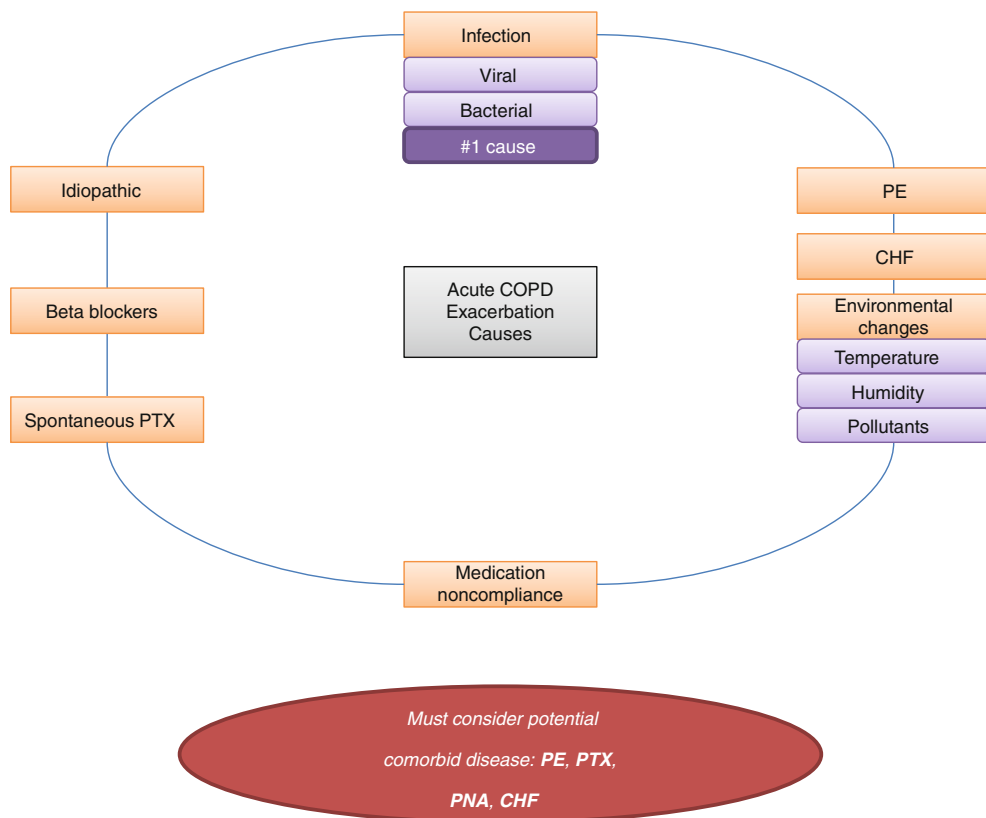
Introduction



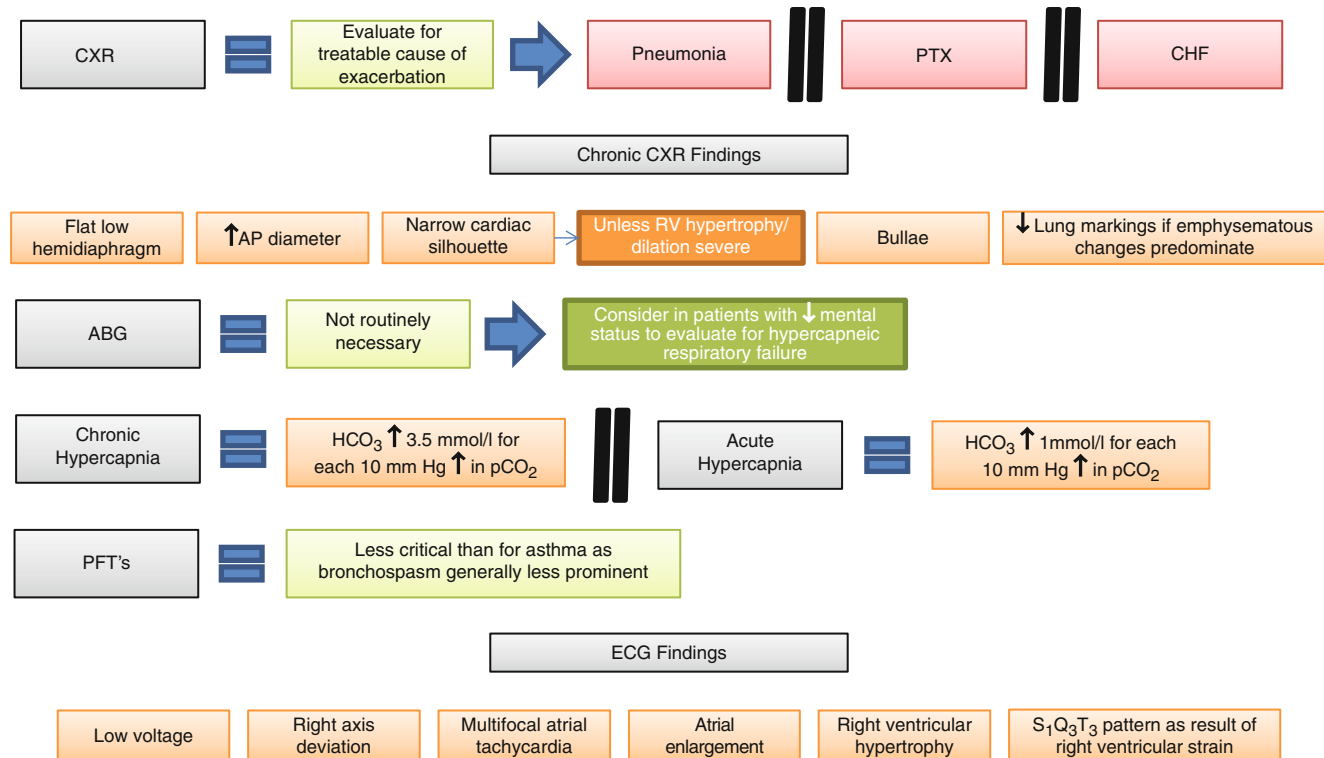
COPD Pathophysiology



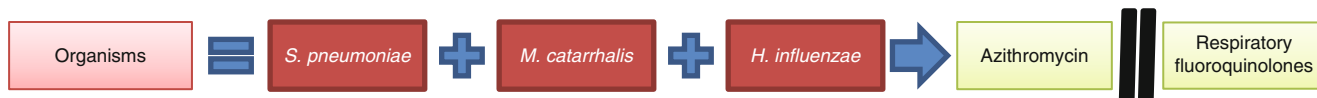
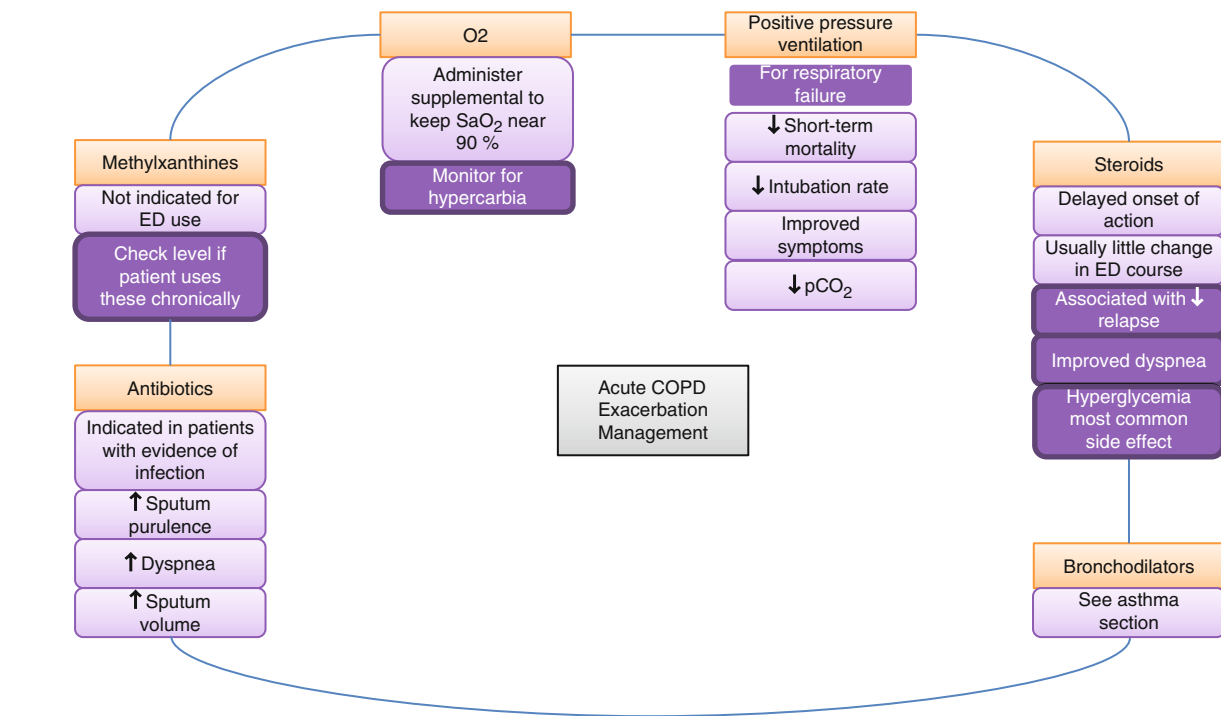
Acute COPD Exacerbation Causes



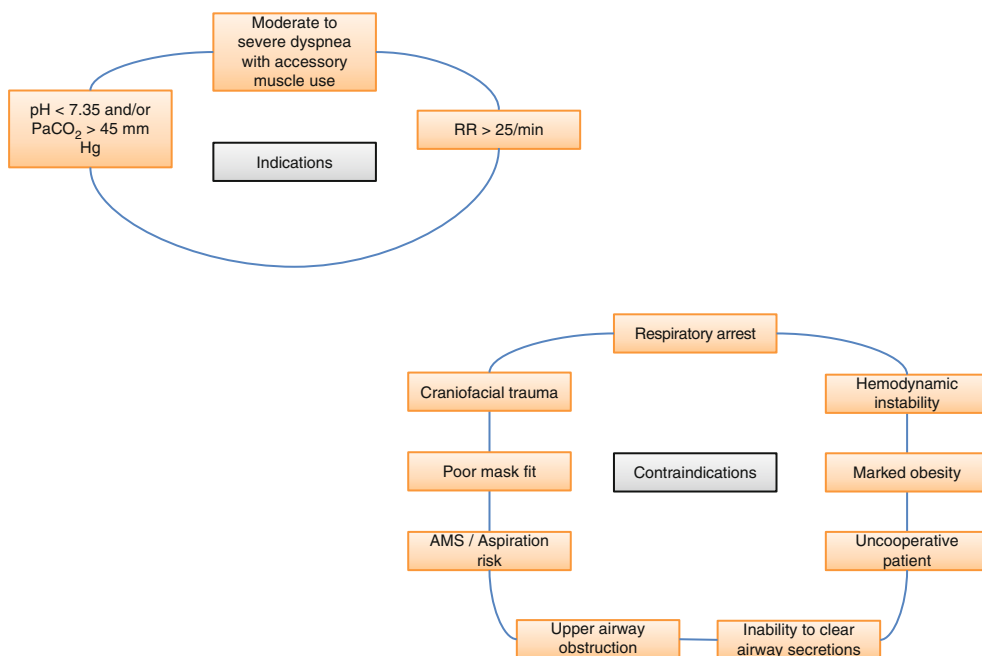
Diagnostics



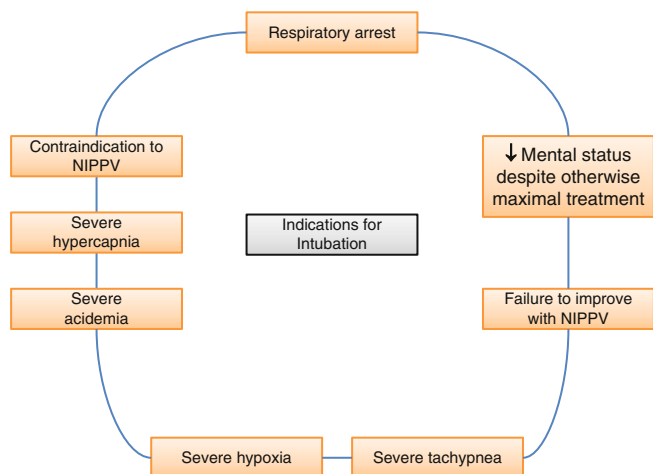
COPD Exacerbation Management



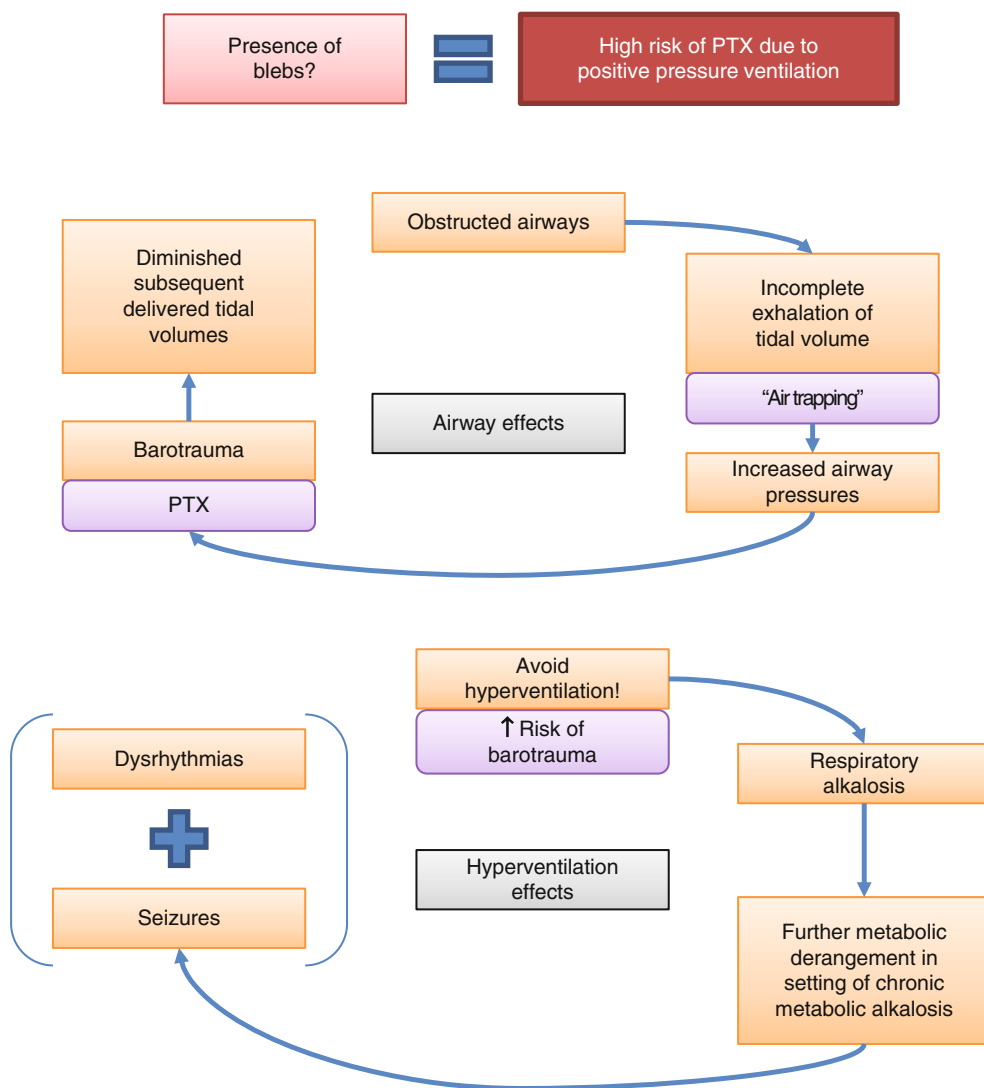
NIPPV Indications and Contraindications



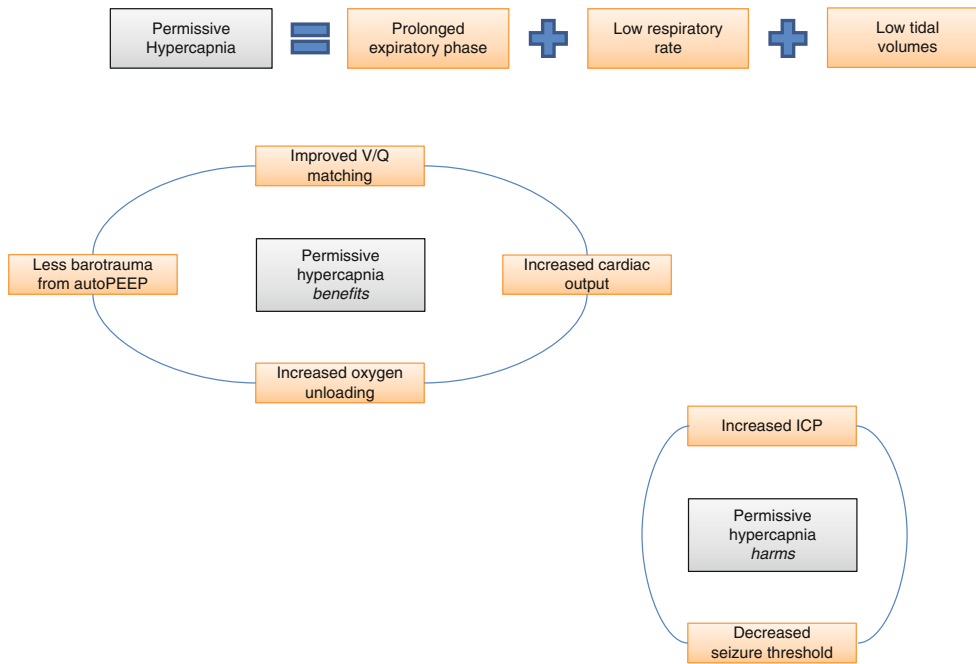
Indications for Intubation



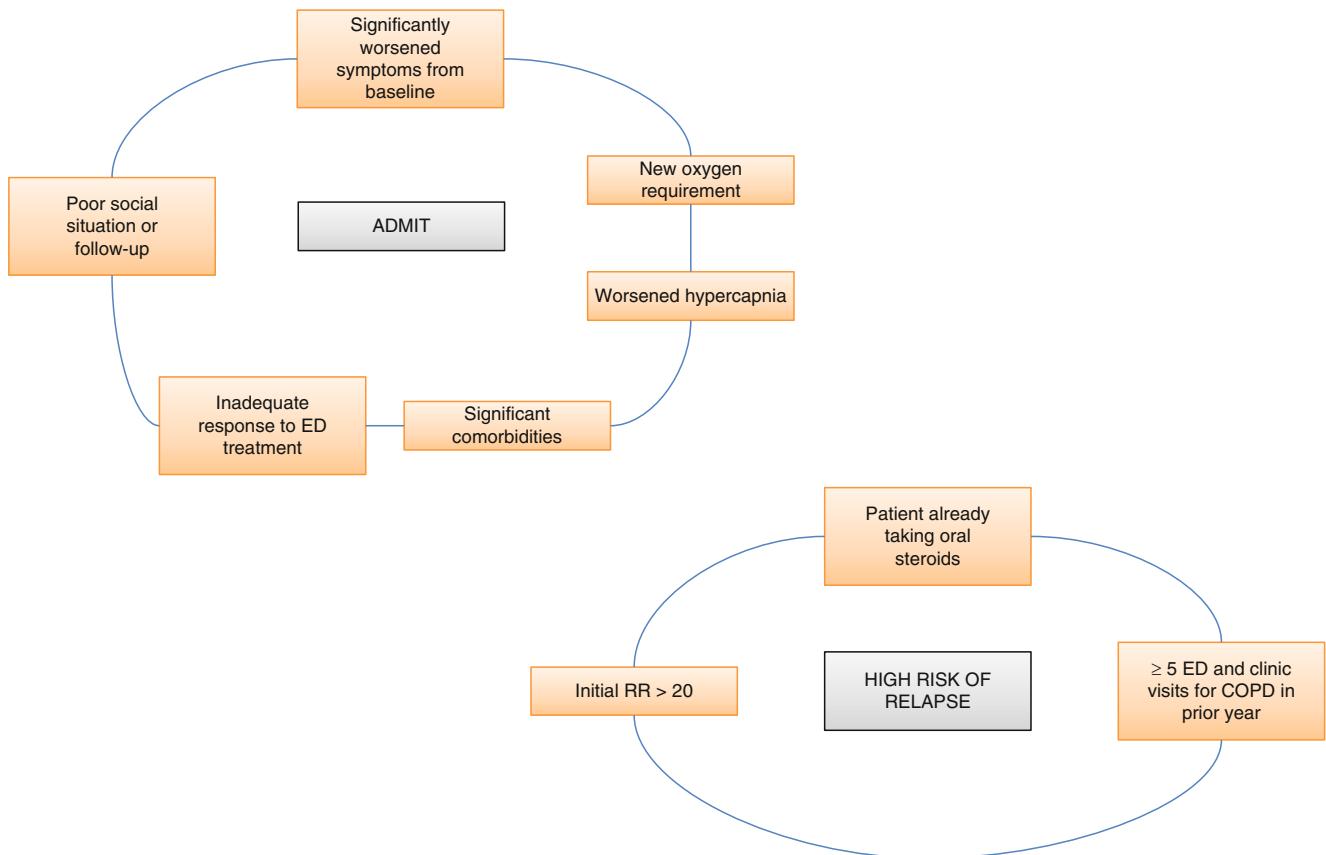
COPD Ventilator Management and Pitfalls



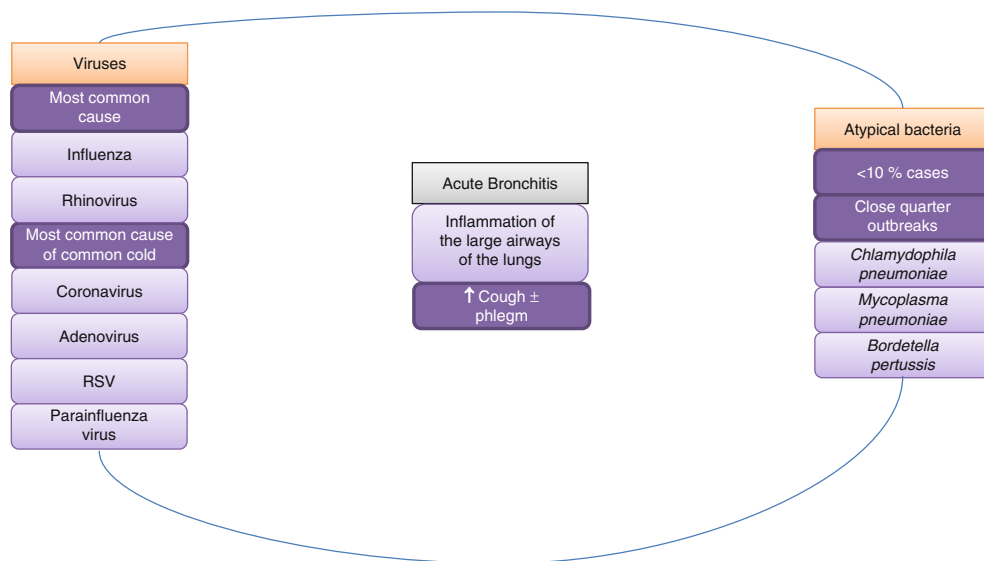
Permissive Hypercapnia



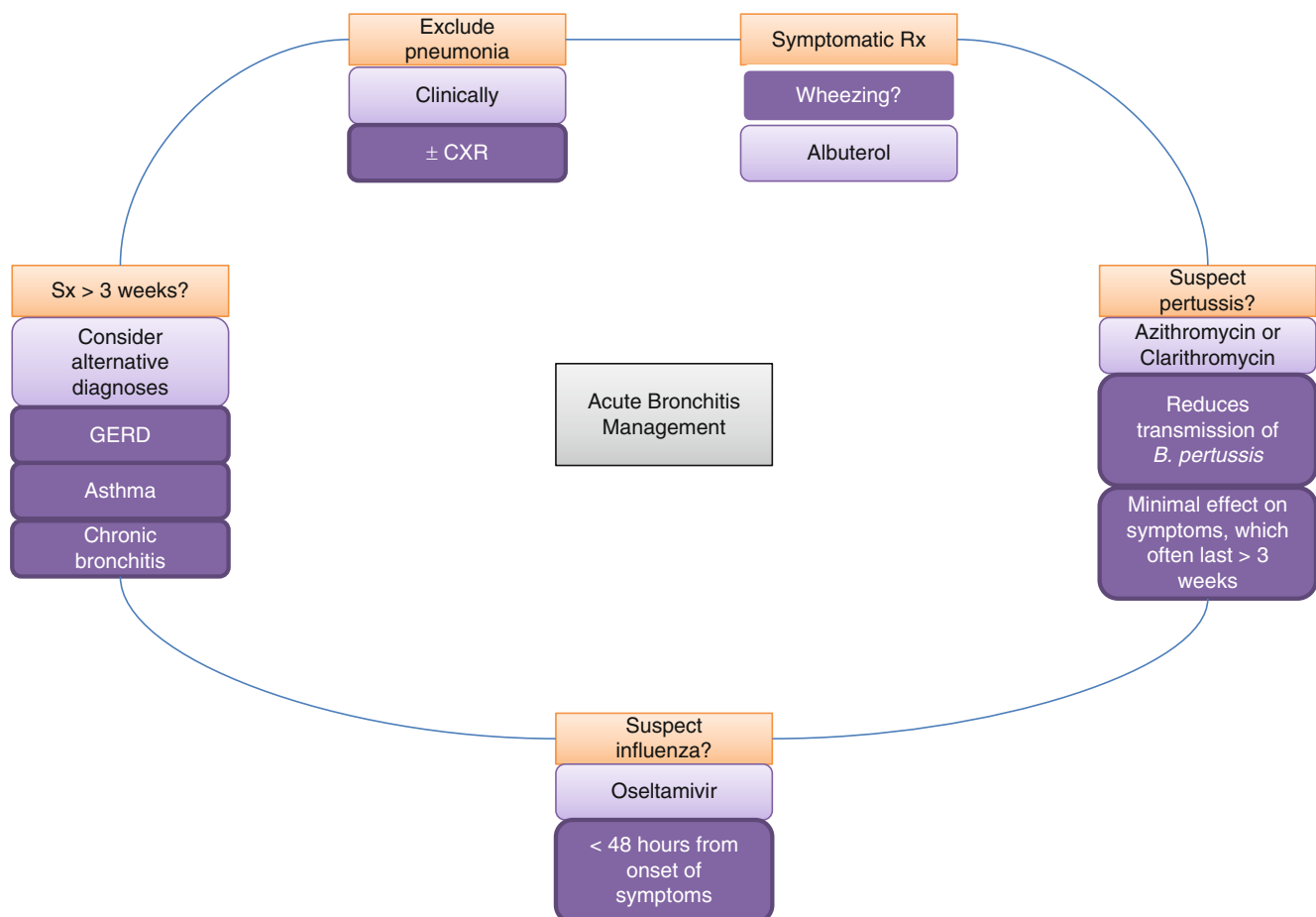
COPD Exacerbation Disposition



Acute Bronchitis

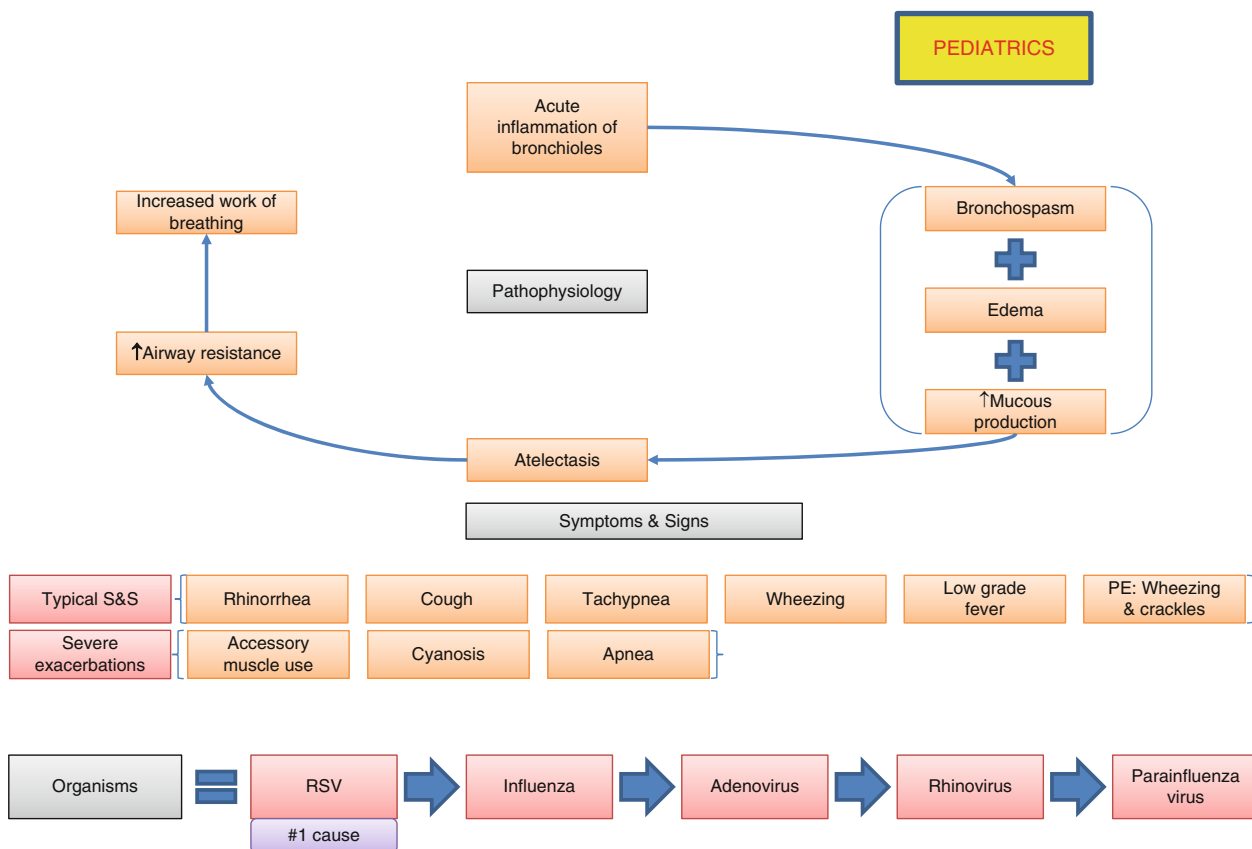


Acute Bronchitis Management

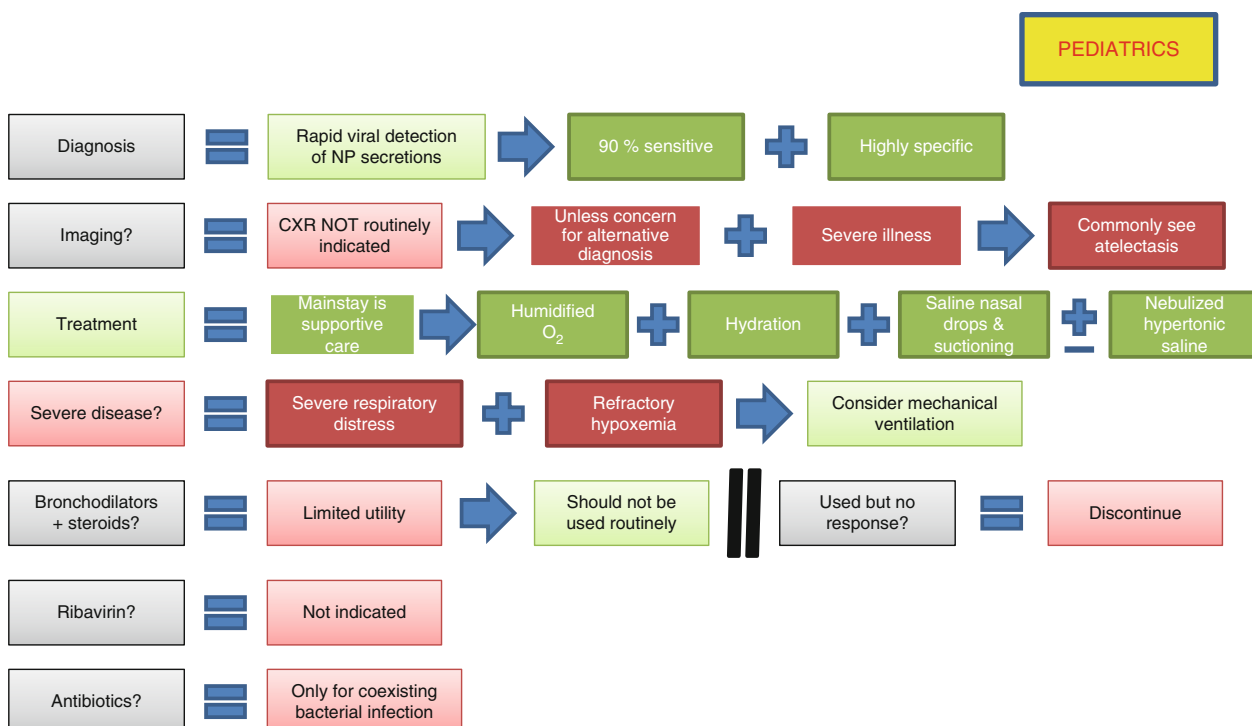


Bronchiolitis

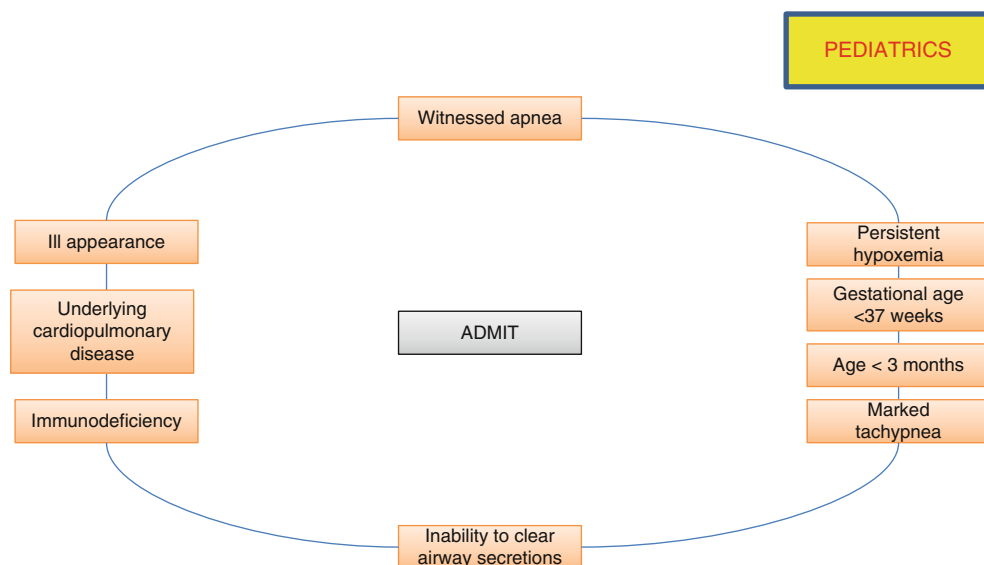
Bronchiolitis



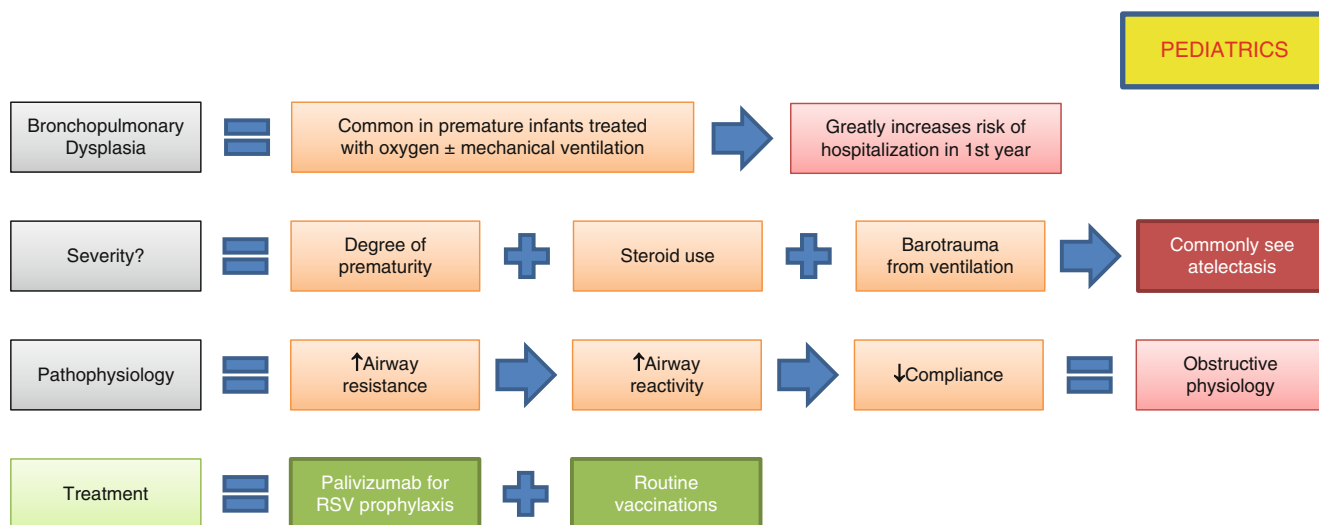
RSV Management



Bronchiolitis Disposition

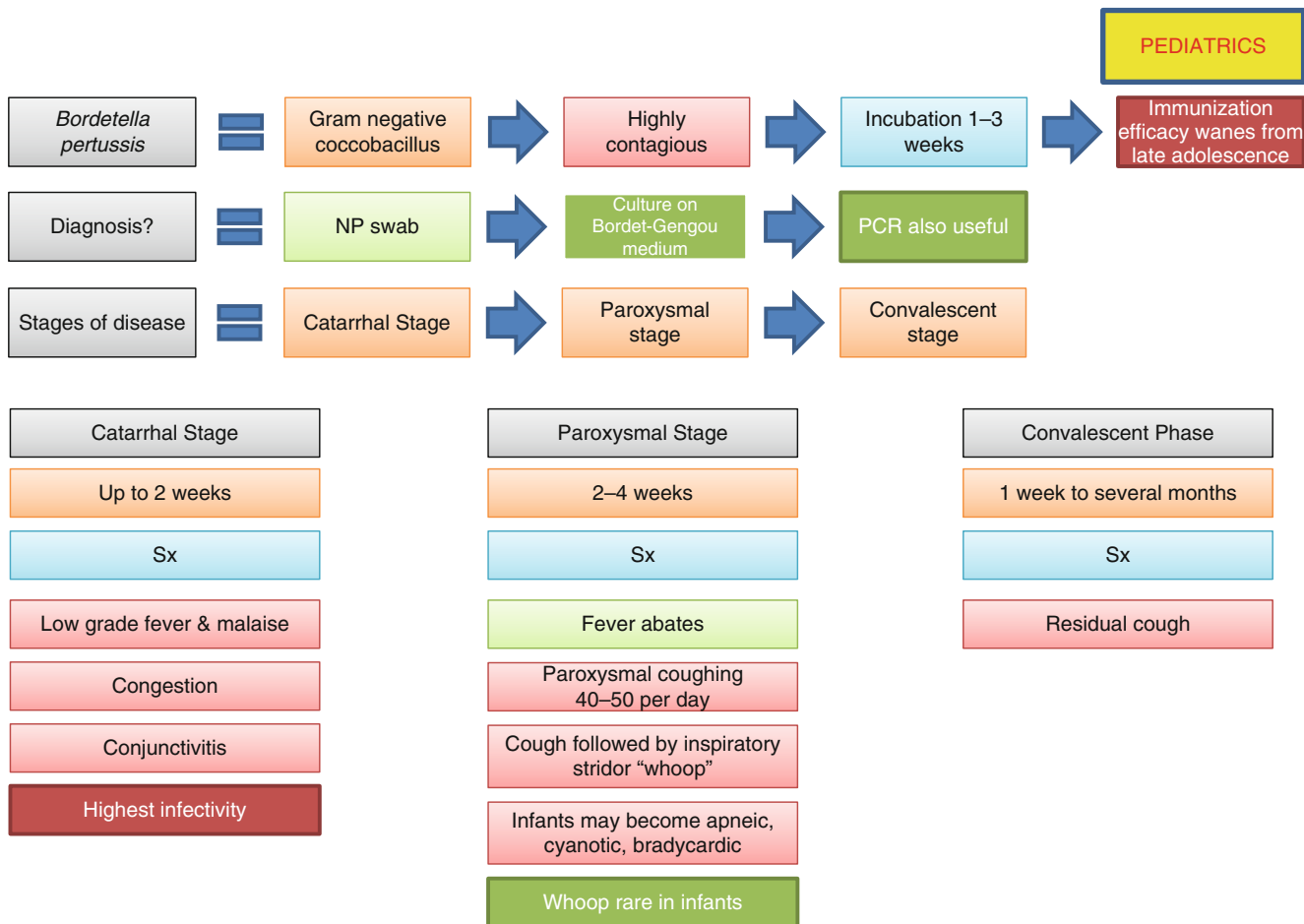


Bronchopulmonary Dysplasia

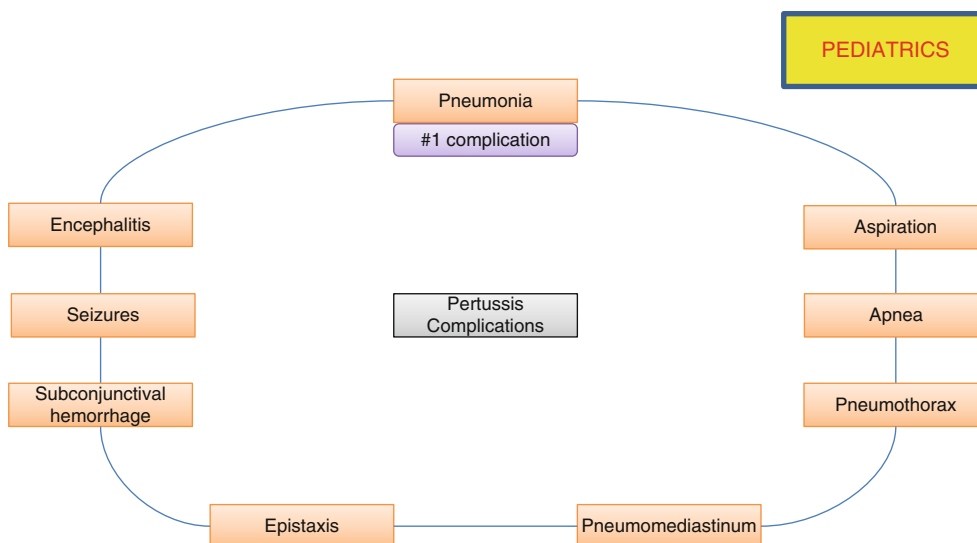


Pertussis

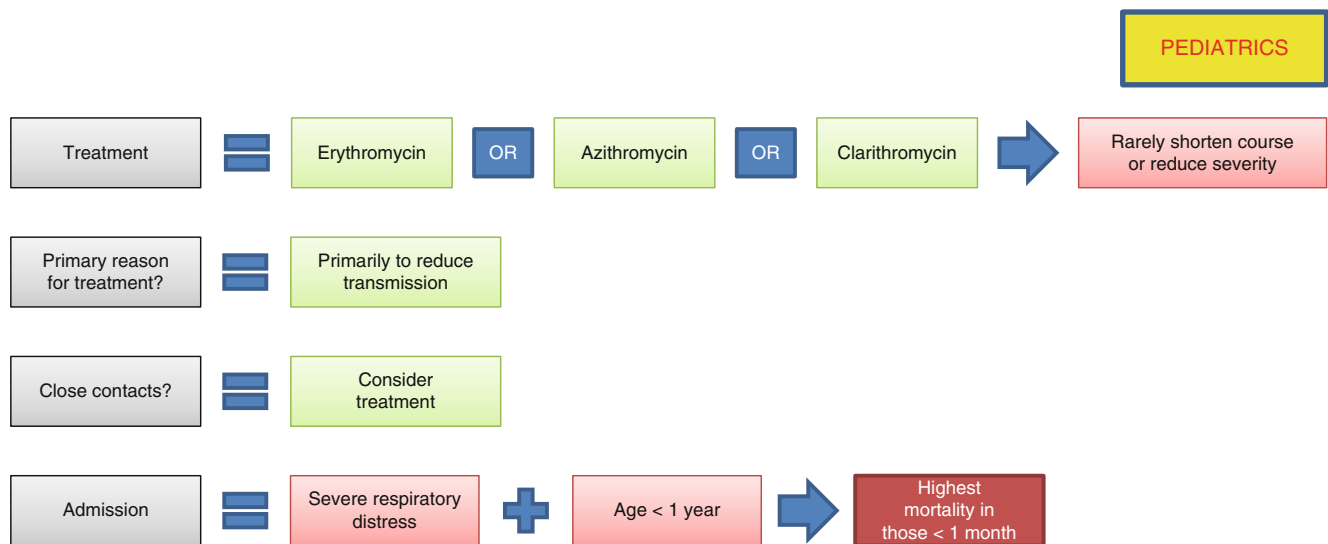
Introduction



Pertussis Complications

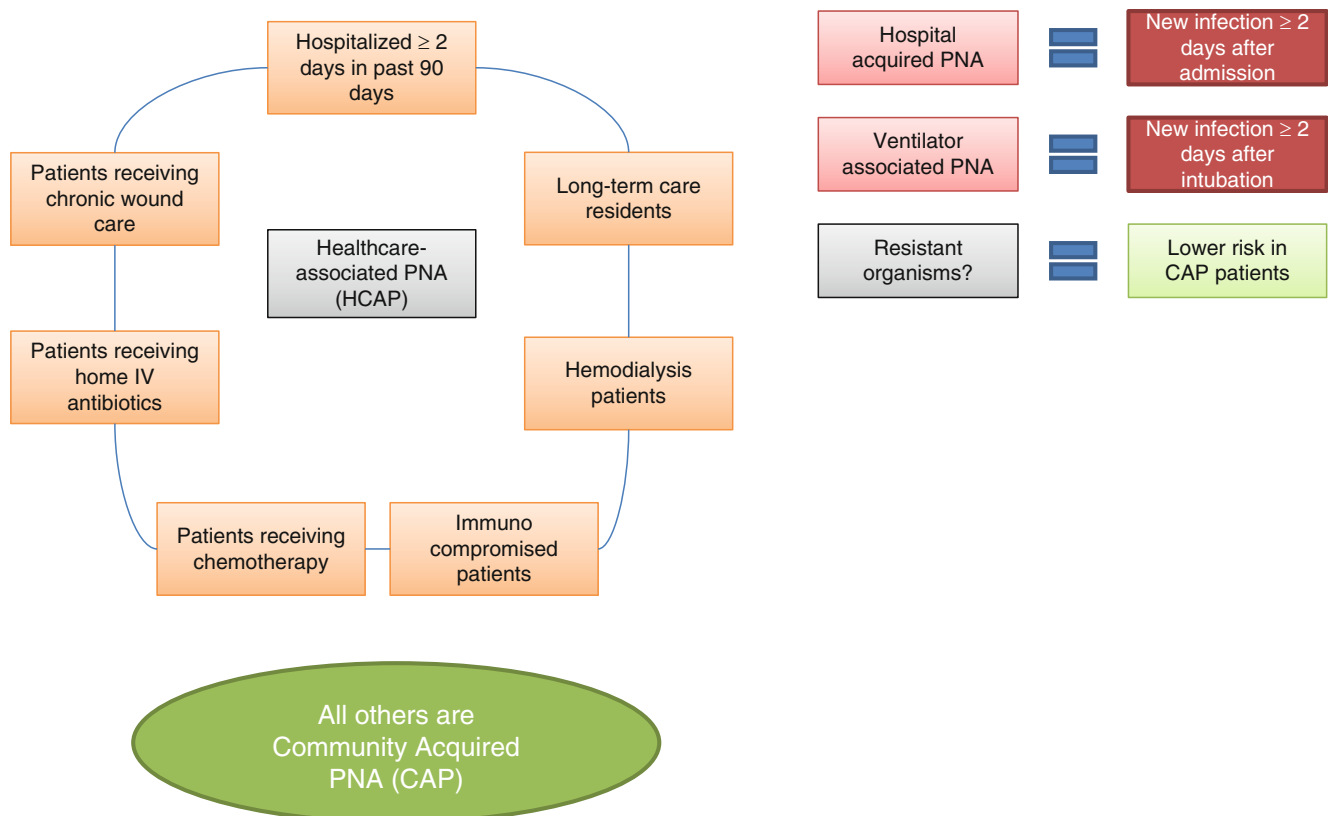


Pertussis Treatment

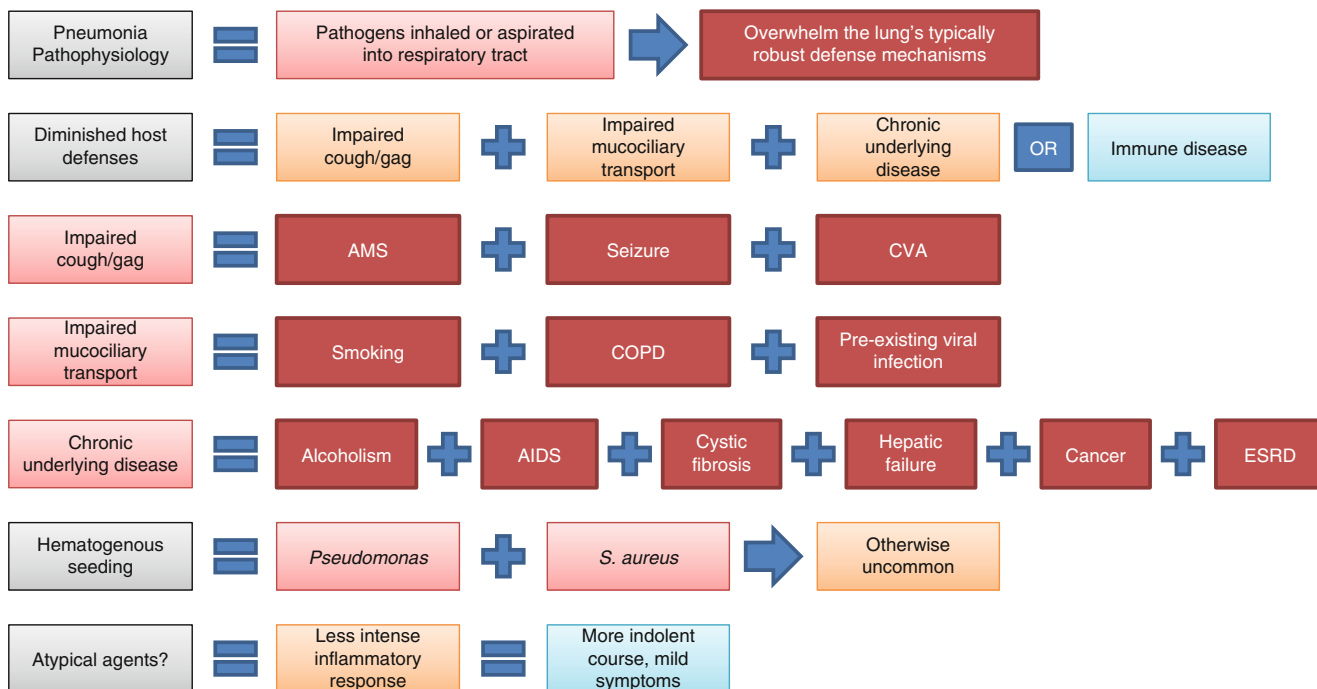


Pneumonia

Pneumonia Classification



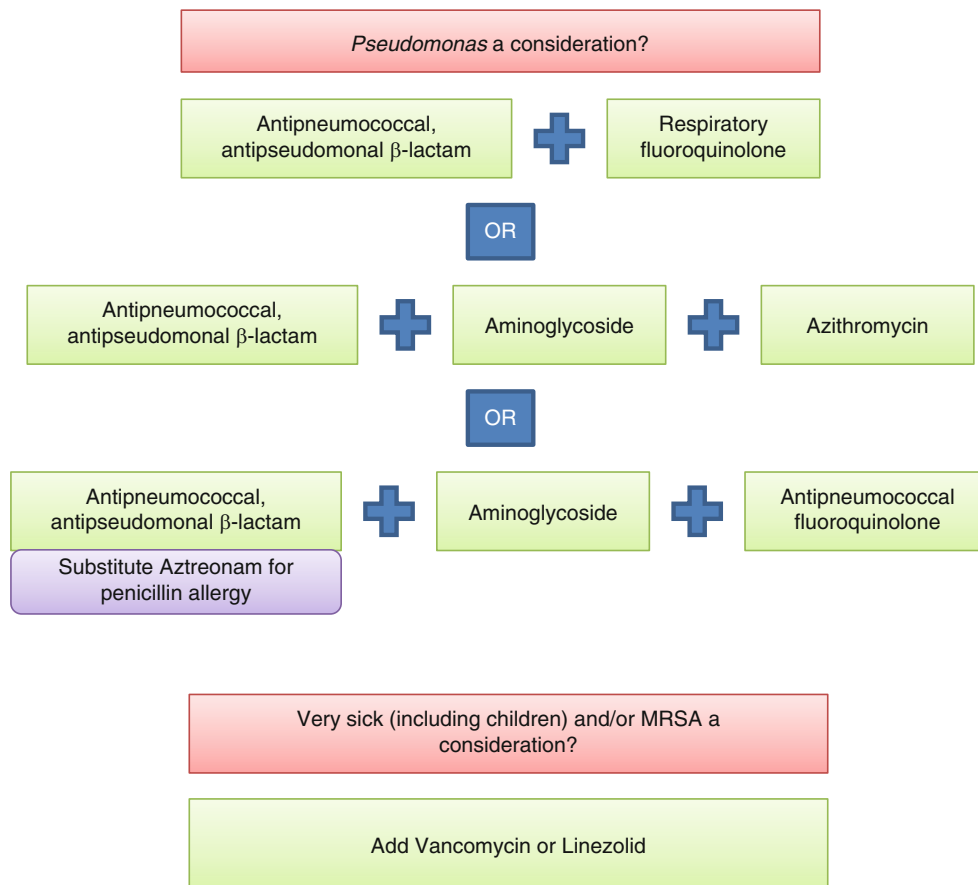
Pneumonia Pathophysiology



Pneumonia Treatment

Patient Type	Organisms	Treatment
Outpatient Previously healthy No Abx within 3 months	<i>S. pneumoniae</i> <i>H. influenza</i> <i>Mycoplasma pneumonia</i> <i>Chlamydophila pneumoniae</i>	Macrolide (preferred) or Doxycycline
Comorbidities Chronic heart, lung, liver, renal disease, DM, Alcoholism, Malignancies, Immune disease	Same as above	Respiratory fluoroquinolone or β-lactam + Macrolide
Inpatients Non-ICU	Same as above + <i>Legionella</i> species Aspiration	Respiratory fluoroquinolone or β-lactam + Macrolide
Inpatients ICU	<i>S. pneumoniae</i> <i>Staph aureus</i> <i>Legionella</i> species Gram (-) bacilli <i>H. influenza</i>	β-lactam + <u>either</u> Azithromycin or Respiratory fluoroquinolone (substitute Aztreonam for the β-lactam if penicillin allergy)

Special Considerations



Pediatric Pneumonia Tidbits and Treatment

PEDIATRICS

Patient Age	Organisms	Treatment
Birth – 3 weeks	Group B Streptococcus <i>E. coli</i> <i>Listeria monocytogenes</i>	Ampicillin + Gentamicin or Cefotaxime
3 weeks – 3 months	<i>S. pneumoniae</i> <i>Bordetella pertussis</i> <i>Chlamydia trachomatis</i> <i>H. influenza</i> Viral – RSV/Parainfluenza	Erythromycin or Cefotaxime
4 months – 4 years	Viruses <i>S. pneumoniae</i> <i>Mycoplasma pneumoniae</i>	Same as above
5 years – 15 years	<i>Mycoplasma pneumonia</i> <i>S. pneumoniae</i>	Erythromycin (Doxycycline if >8) or Cefotaxime

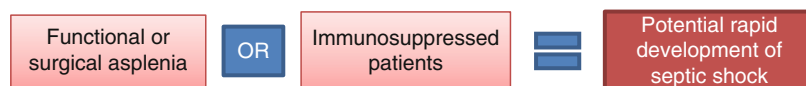
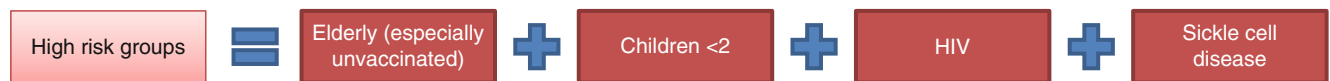
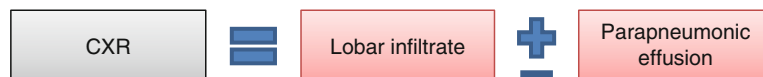
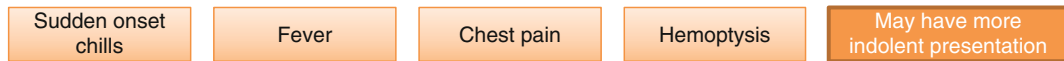
Group B streptococcus = Most common cause → Acquired in utero → Results in a rapid fulminant disease process

Symptoms & Signs → 3 weeks – 3 months – Typical bacteria

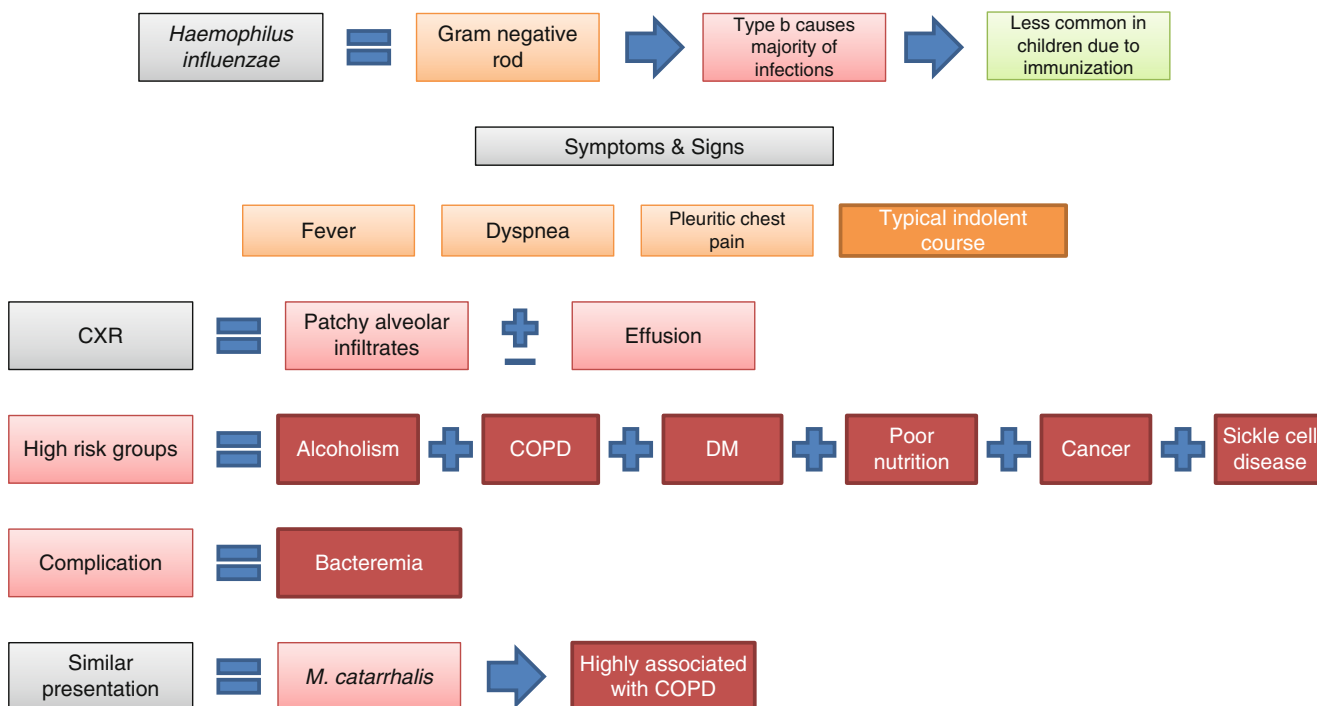
Decreased feeding	Fever	Tachypnea	Nasal flaring	Intercostal retractions	Grunting	Severe irritability
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Symptoms & Signs → Chlamydia

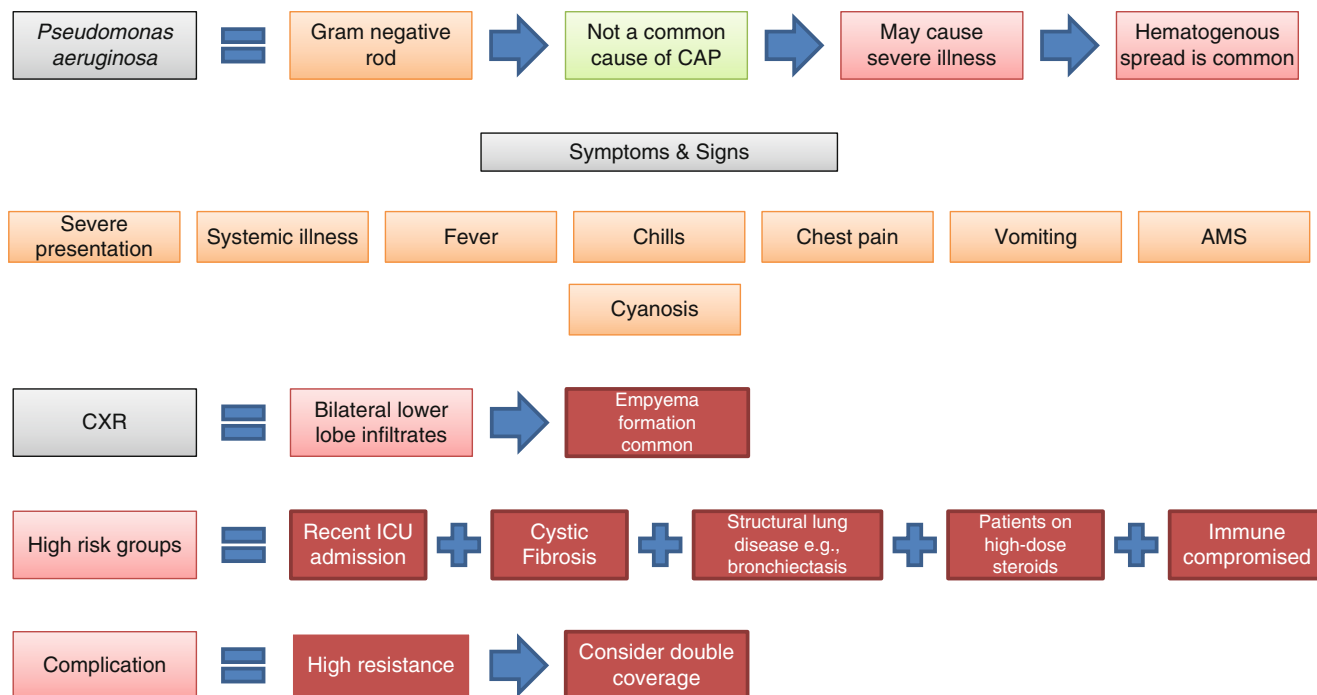
Afebrile	<u>Staccato cough</u> Short sudden bursts of cough	Tachypnea	Conjunctivitis	Lung hyperinflation
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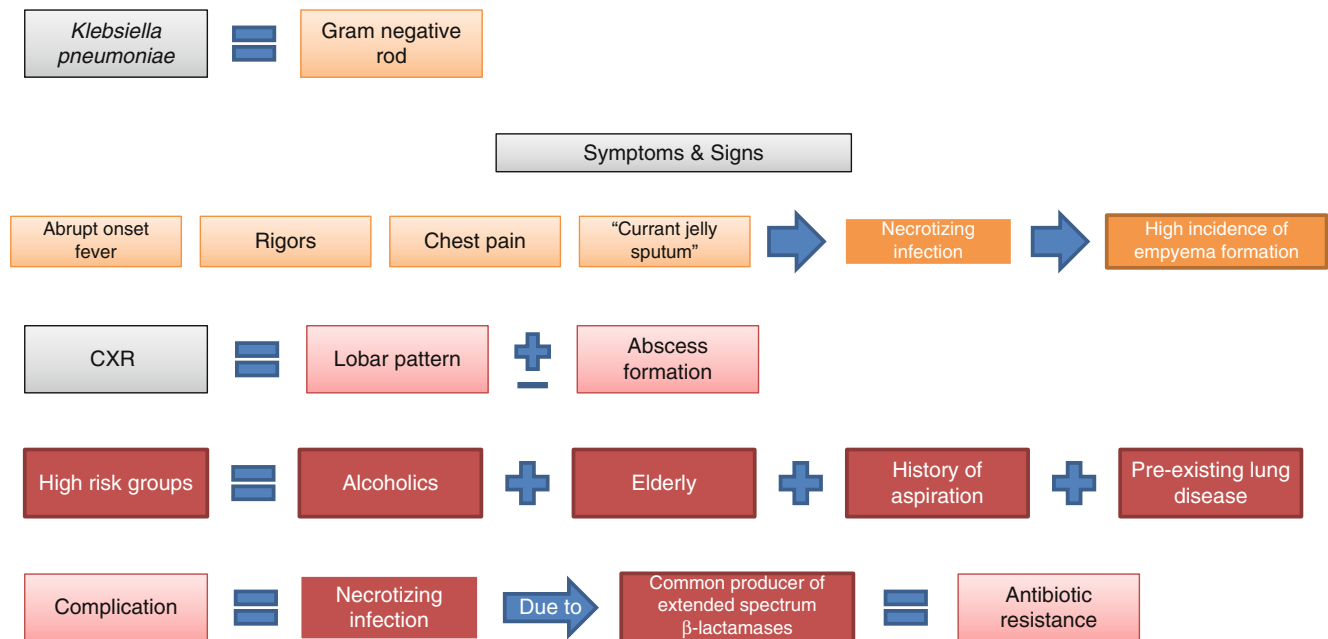
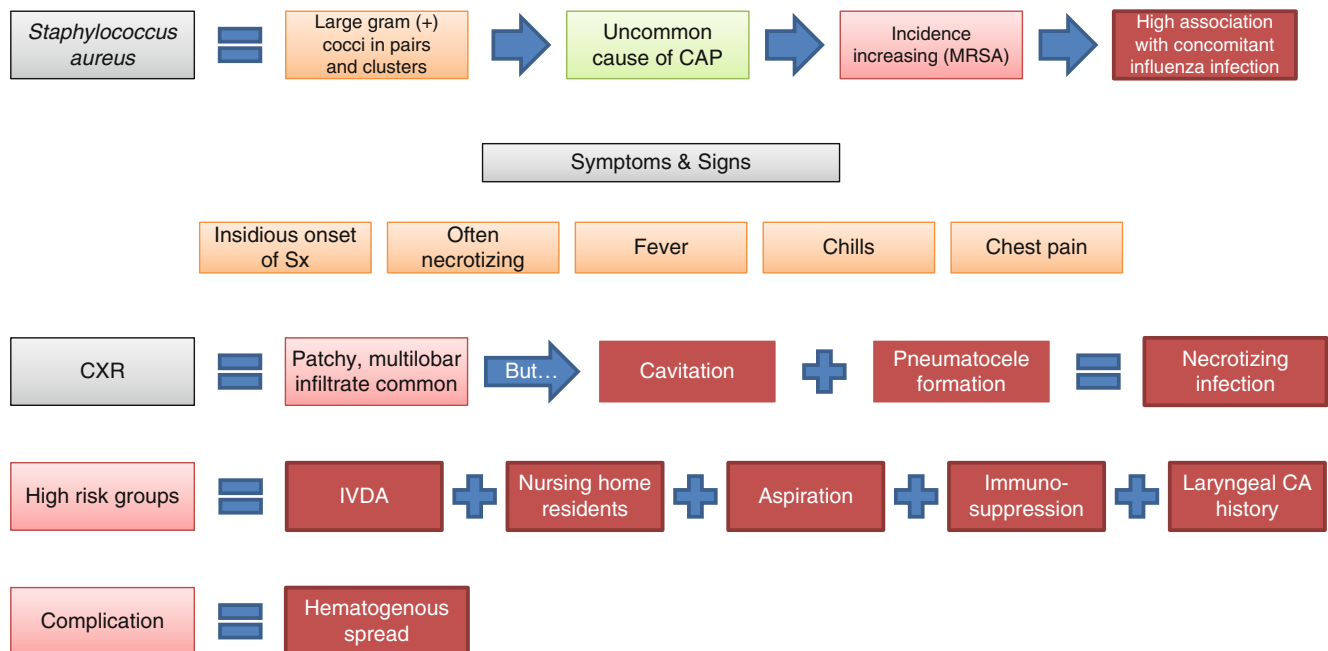
Streptococcus pneumoniae**Symptoms & Signs**

Haemophilus influenzae

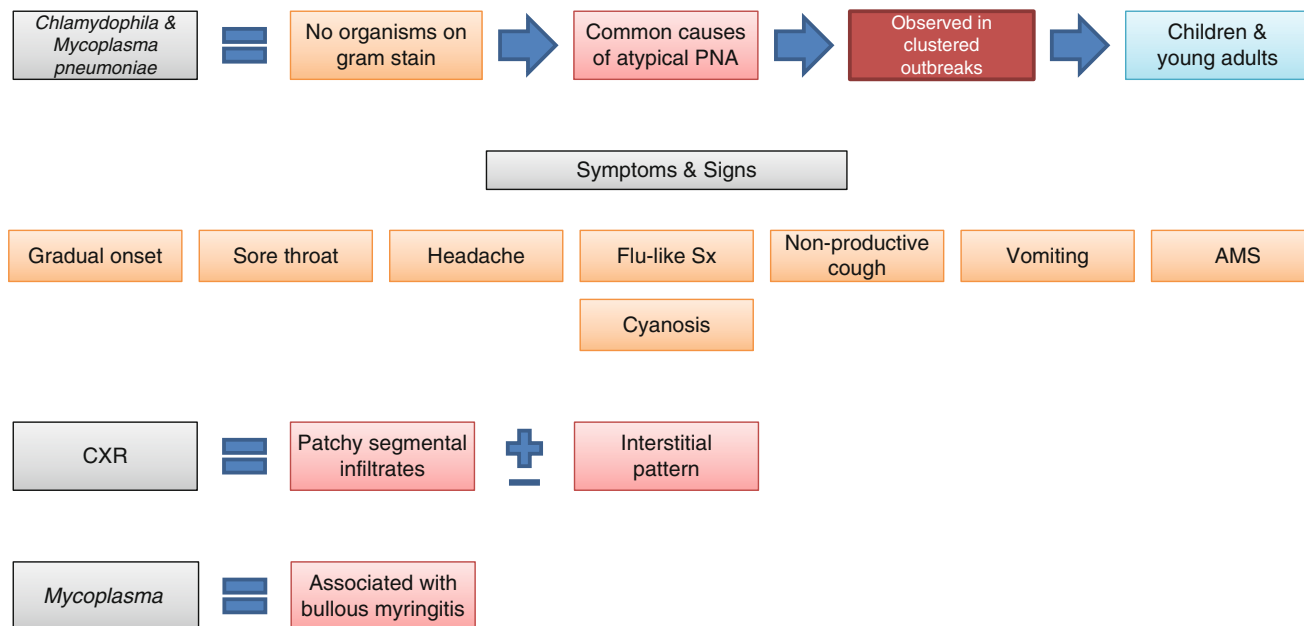


Pseudomonas aeruginosa

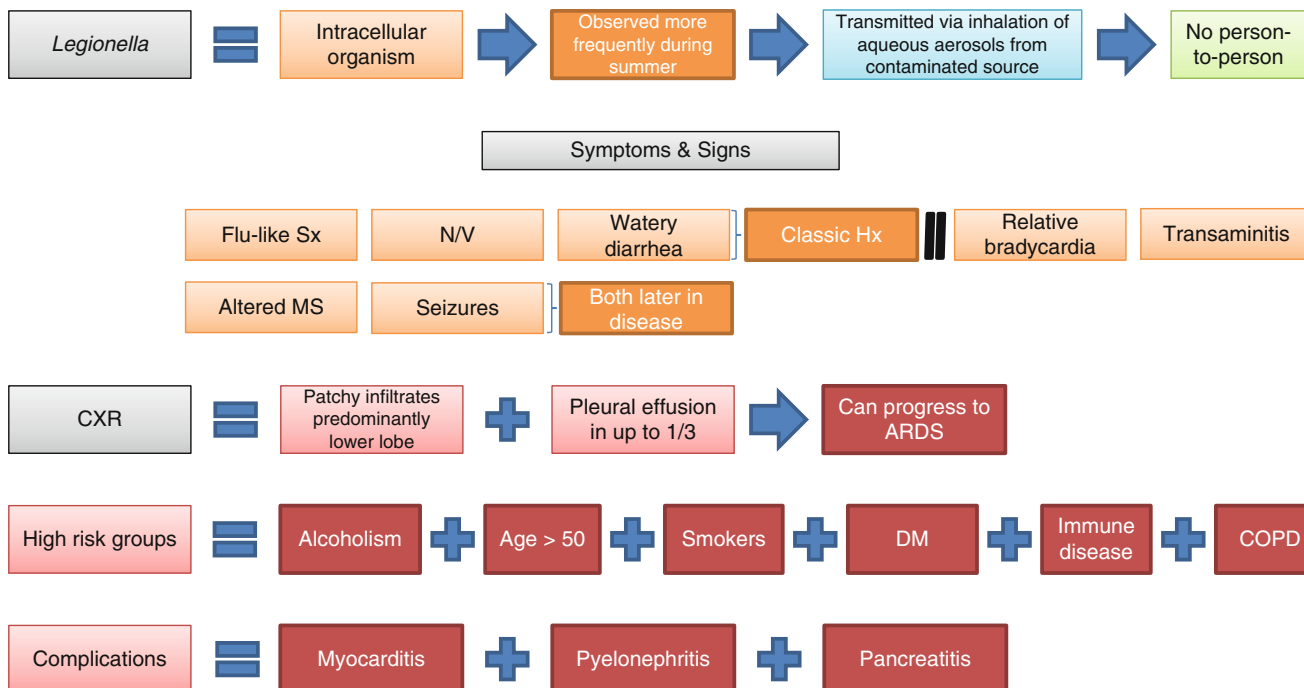


Klebsiella pneumoniae***Staphylococcus aureus***

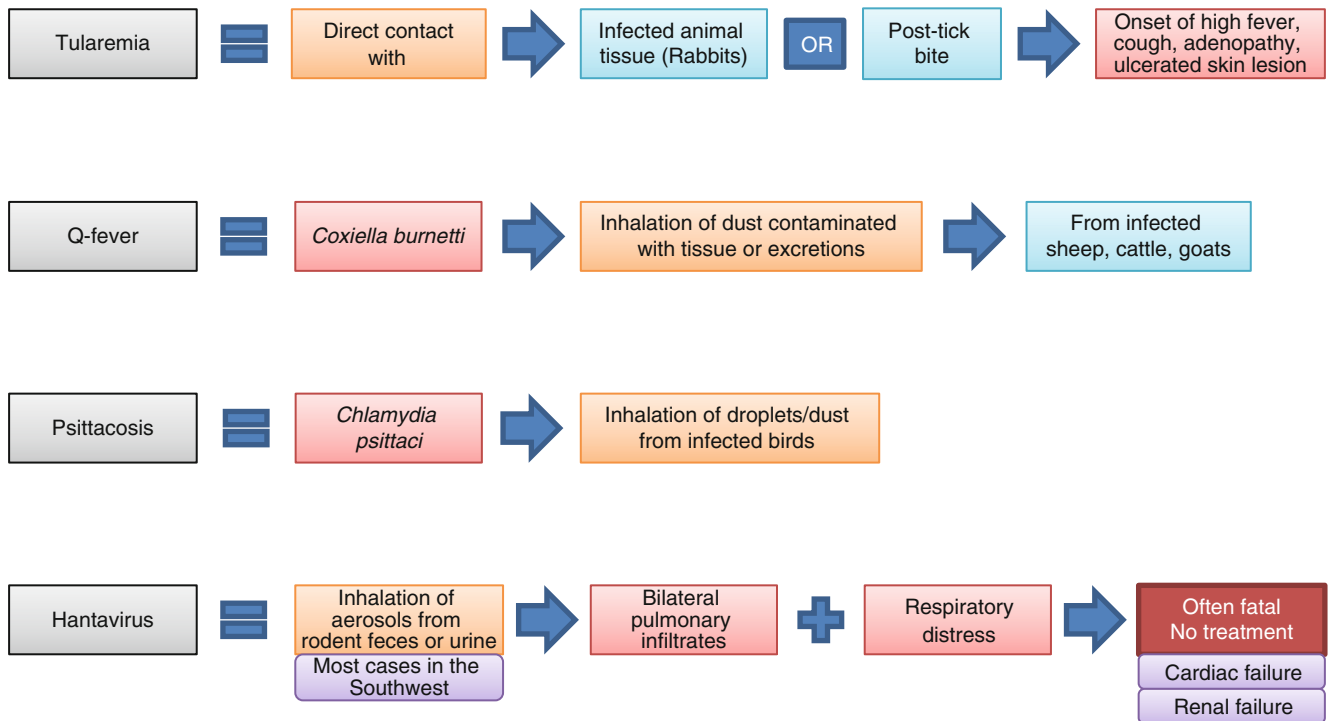
Chlamydomphila* and *Mycoplasma pneumoniae



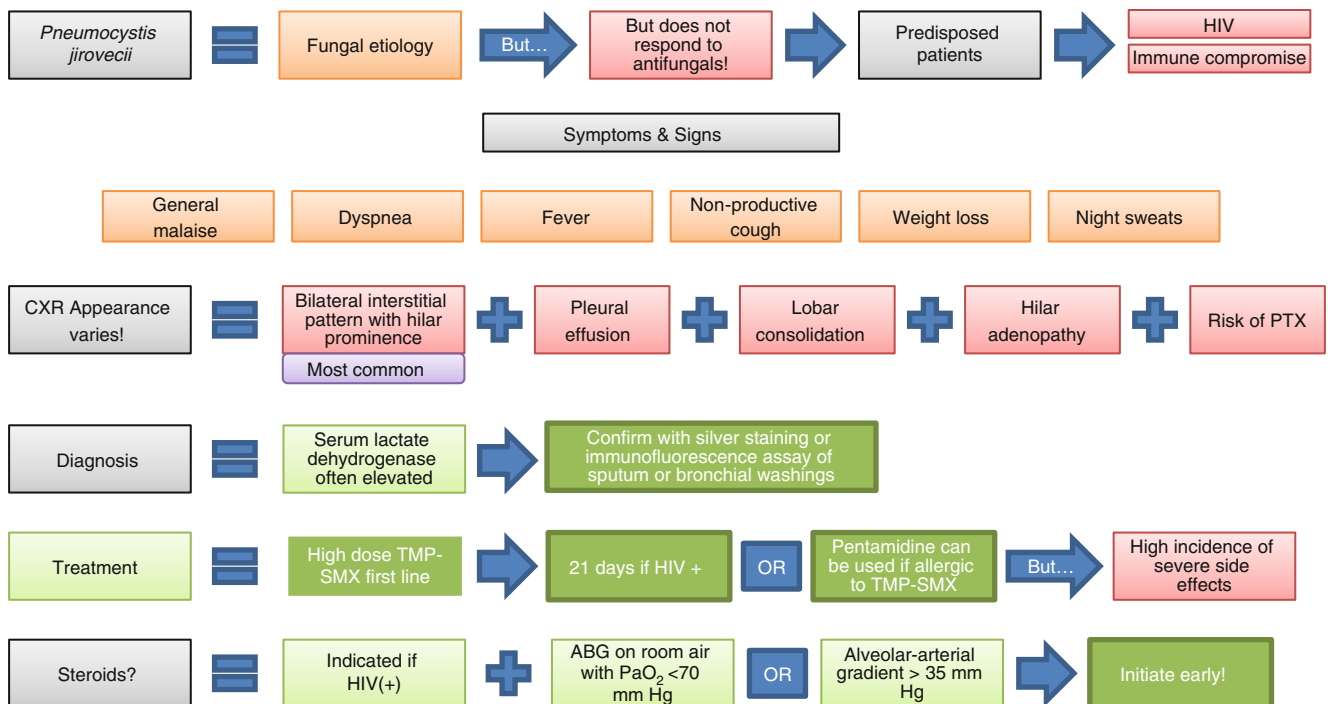
Legionella



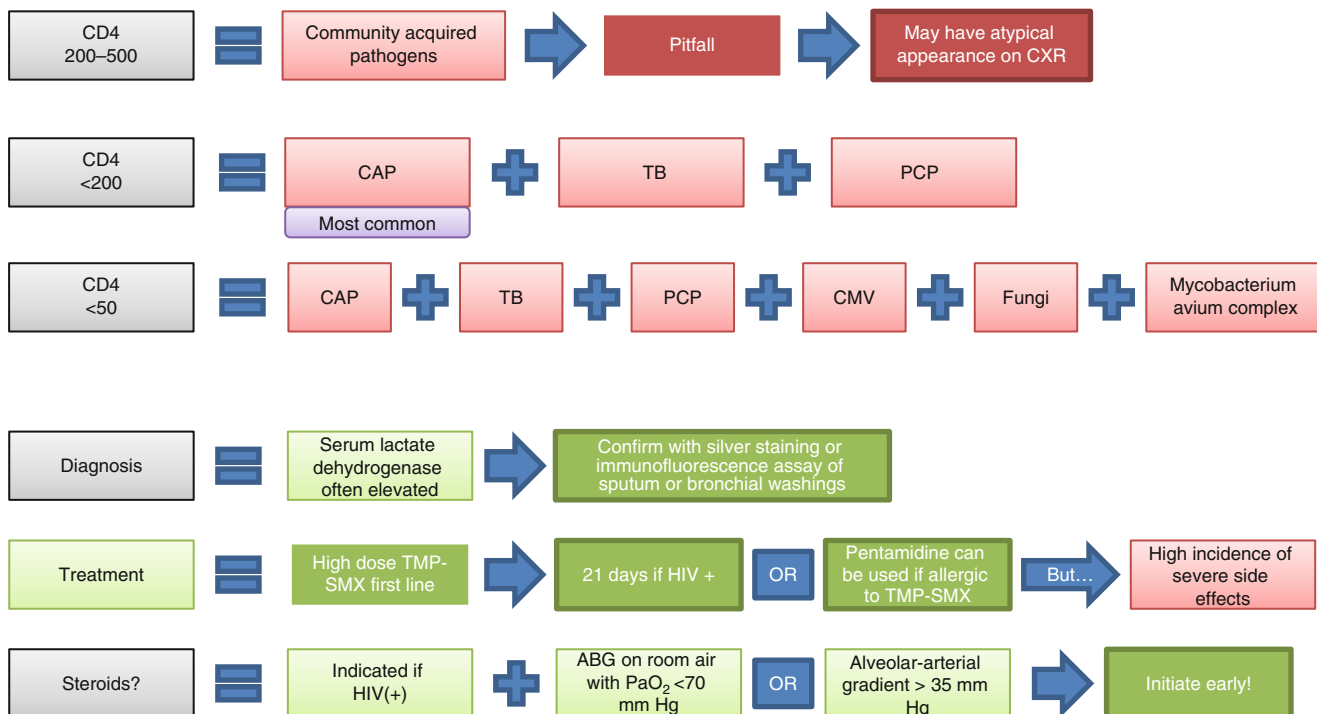
Zoonotic PNA Etiologies



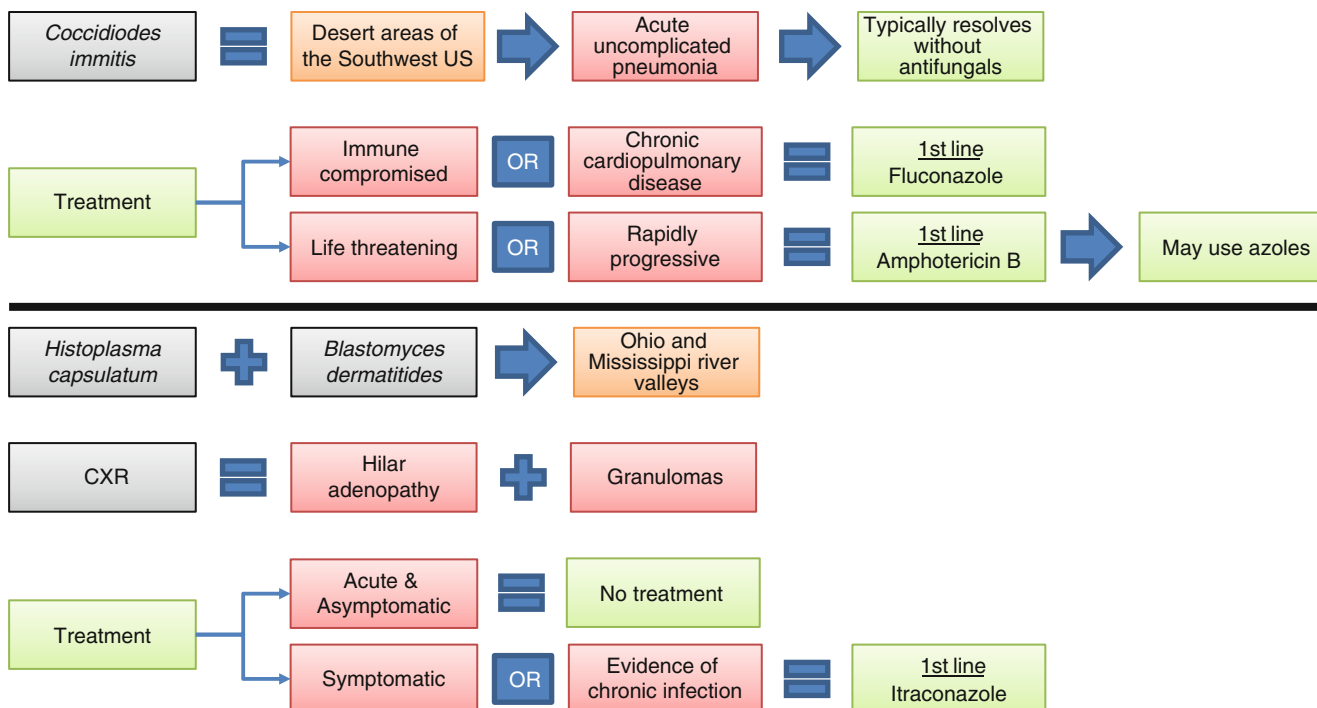
Pneumocystis jirovecii (Formerly PCP)



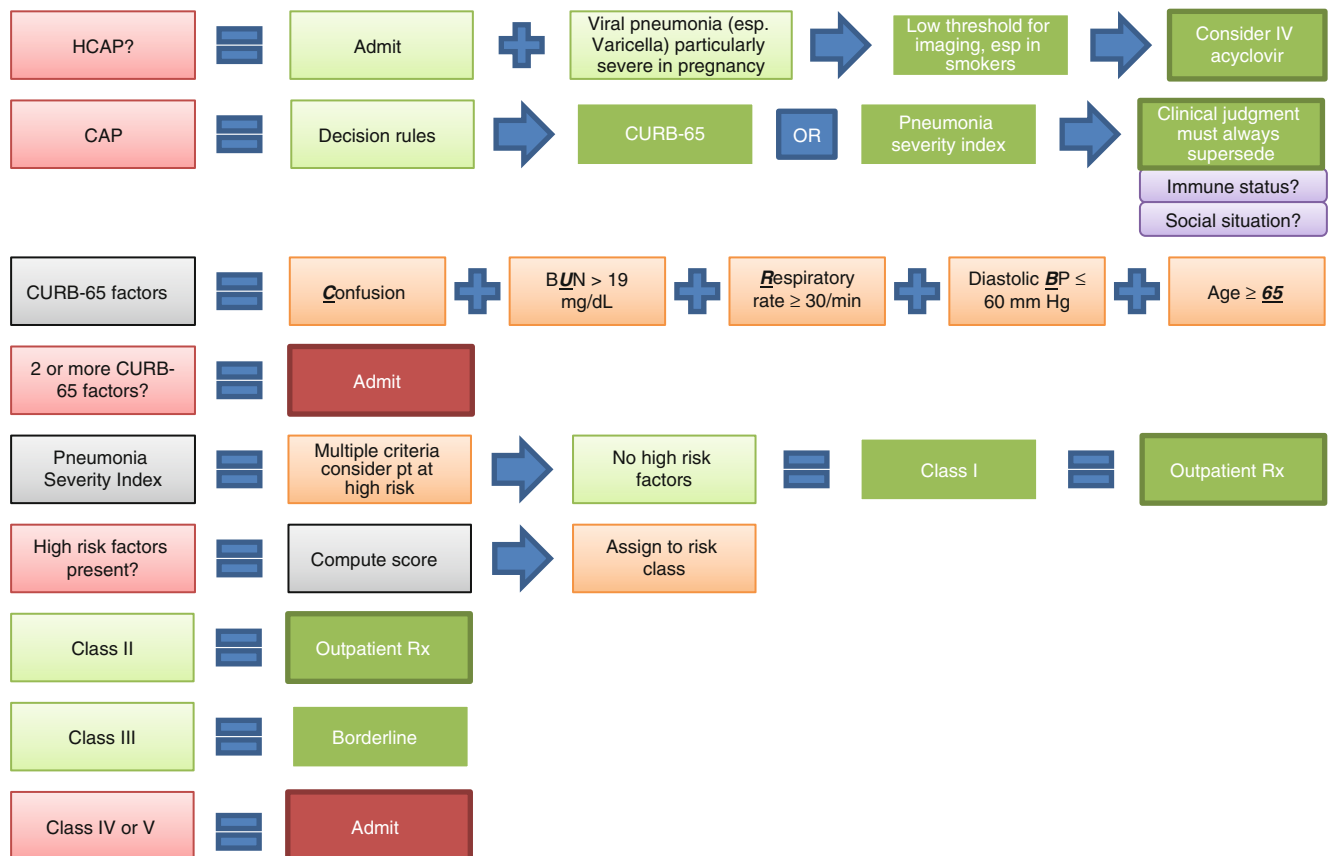
Pathogens in HIV



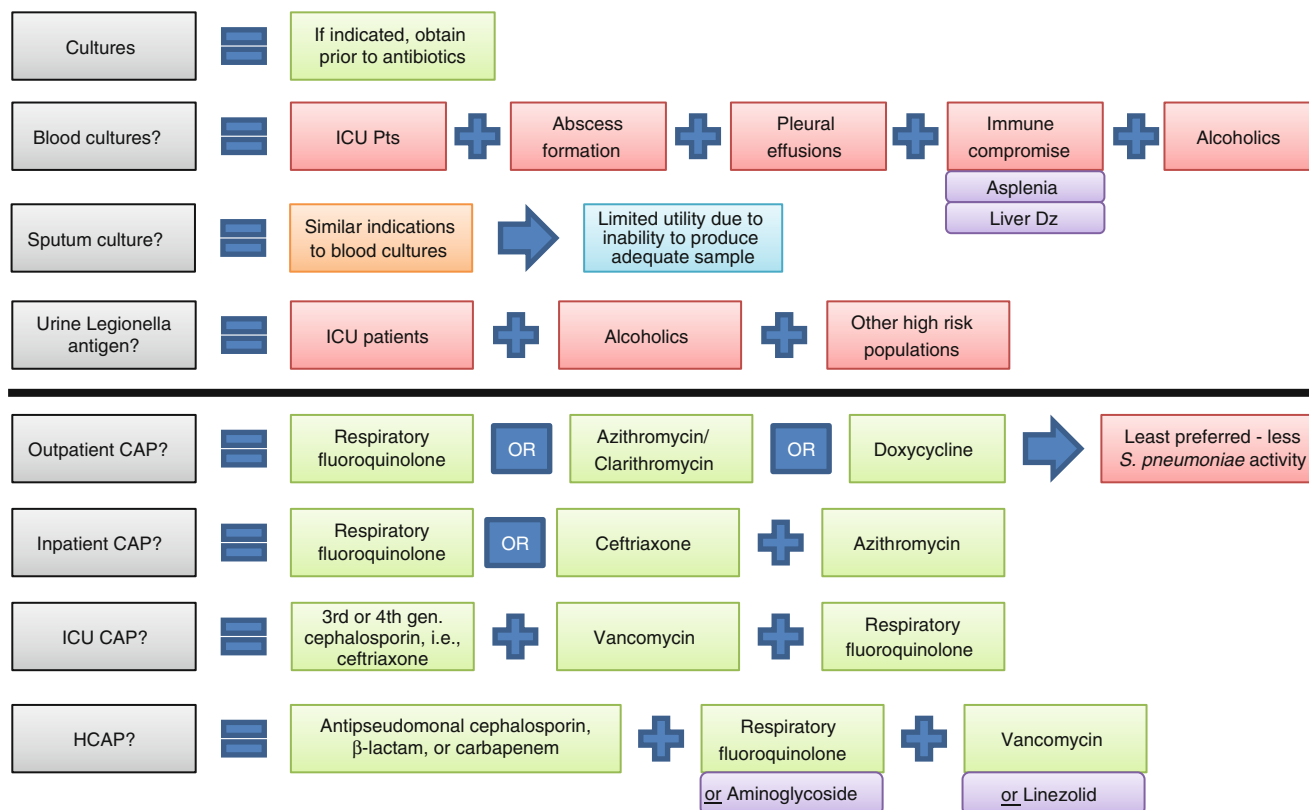
Fungal PNA Etiologies



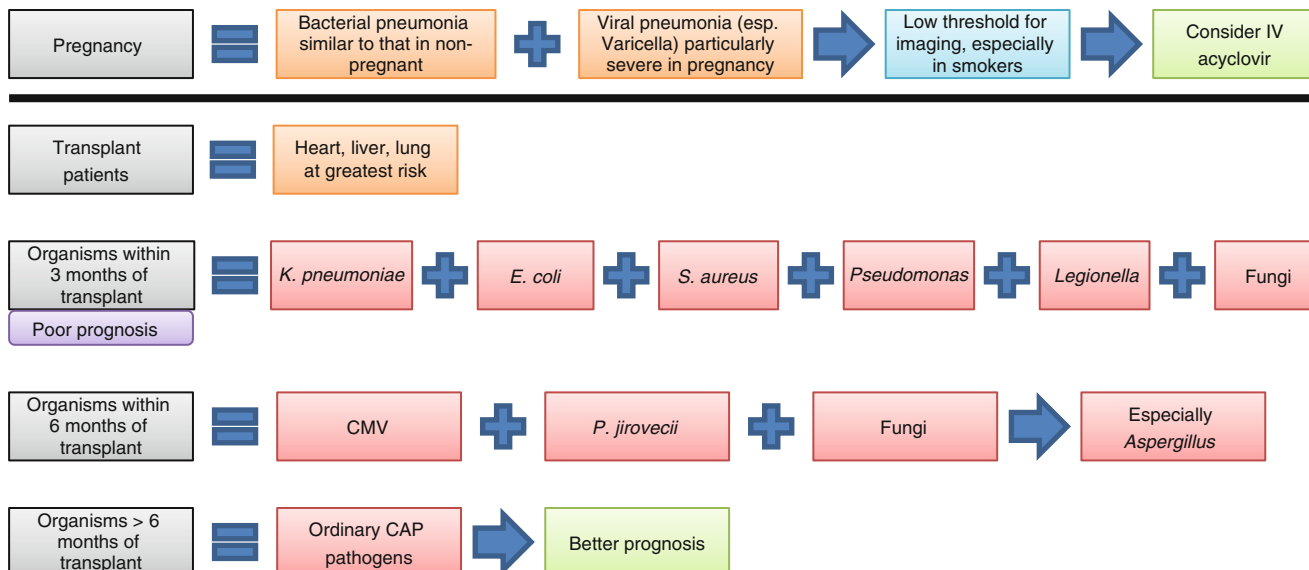
Disposition



Cultures and Treatment

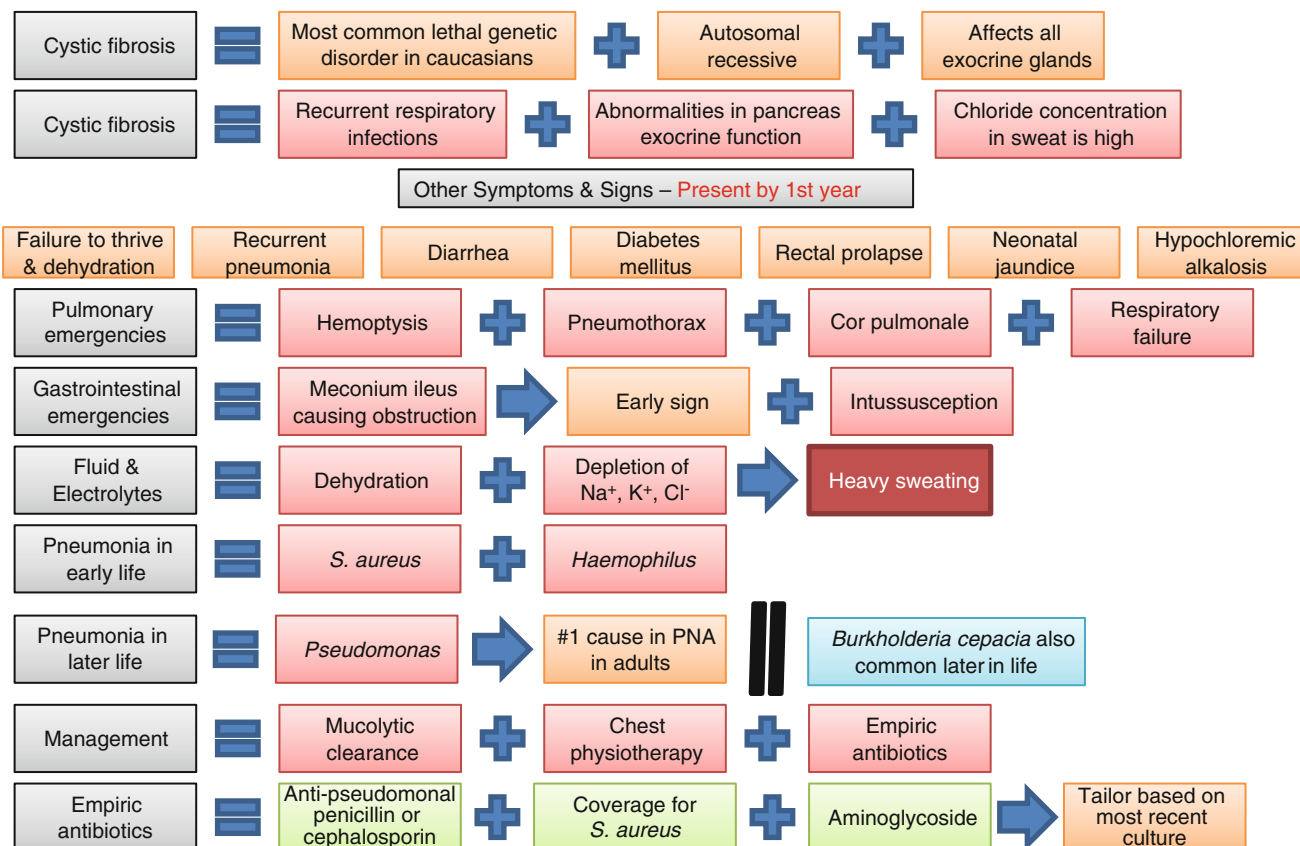


Pneumonia in Special Patients

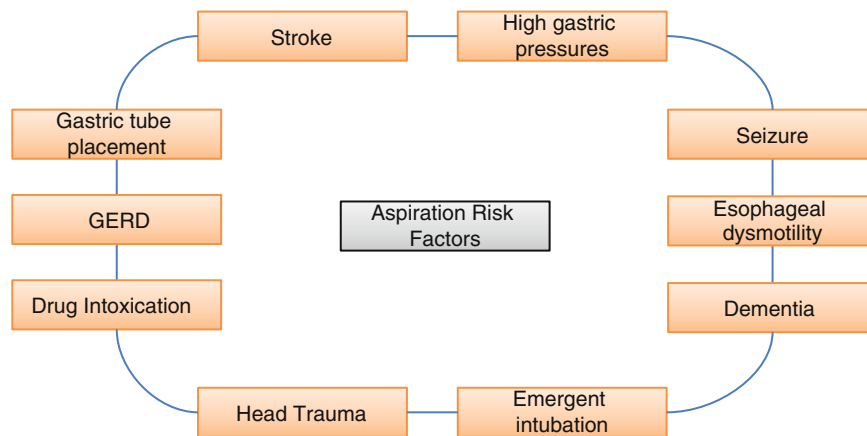
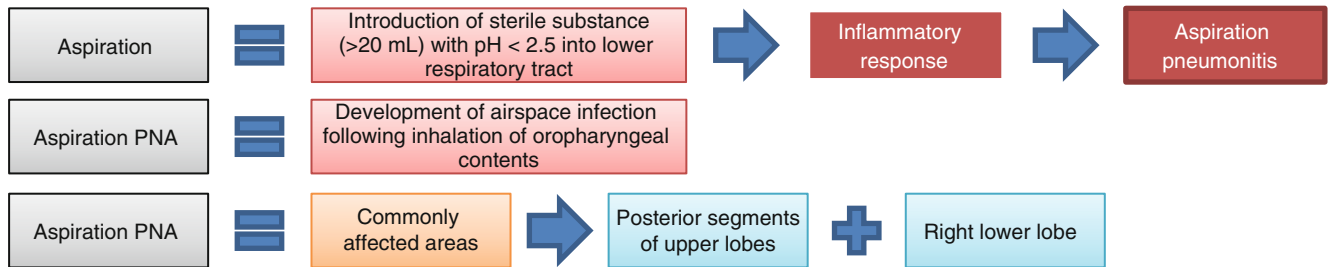


Cystic Fibrosis

PEDIATRICS



Aspiration



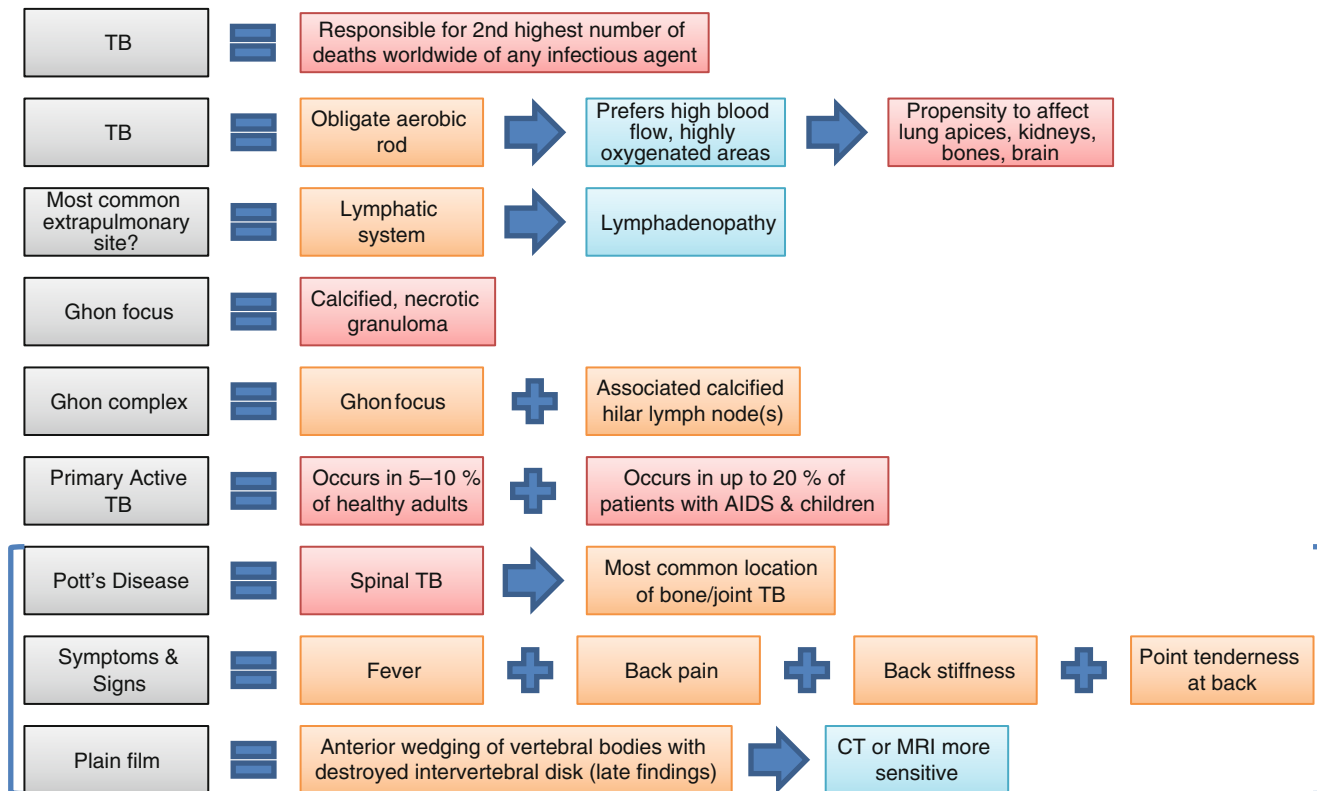
The flowchart provides a systematic approach to managing aspiration pneumonia (PNA). It begins with 'Aspiration Management', which leads to 'Suction airway'. A decision point 'Witnessed?' follows; if 'No evidence that corticosteroids improve outcomes', the path leads to 'Intubate pt', which then leads to 'Decompress stomach with gastric tube'. If 'Witnessed?' is 'Yes', the path leads to 'Concern for recurrent aspiration?'. If 'Yes', it leads to 'Intubate pt' and then 'Decompress stomach with gastric tube'. If 'No', it leads to 'Treat'. 'Steroids?' leads to 'No evidence that corticosteroids improve outcomes'. 'Wheezing?' leads to 'Bronchodilators'. 'Prophylactic antibiotics?' leads to 'NOT indicated for pneumonitis'. 'When to treat aspiration for PNA?' leads to 'Fever', 'Productive cough', and 'New infiltrate on CXR'. 'Aspiration in community?' leads to 'Coverage for CAP pathogens', which then leads to 'S. pneumoniae H. influenzae' and 'Anaerobic coverage'. 'Aspiration in health care setting?' leads to 'Coverage for HCAP pathogens', which then leads to 'Pseudomonas S. aureus' and 'Anaerobic coverage'. 'Admission criteria' leads to 'Chronically ill', 'Nursing home residents', 'New infiltrate on CXR', 'Hypoxemia', and 'Persistent Sx'. 'Reliable & asymptomatic?' leads to 'Observe x 1 hour', which then leads to 'Strict return precautions' (Dyspnea, Cough, Fever) and 'NO prophylactic antibiotics'. 'Persistent Sx' includes 'Dyspnea', 'Cough', 'Tachypnea', and 'Wheezing'.

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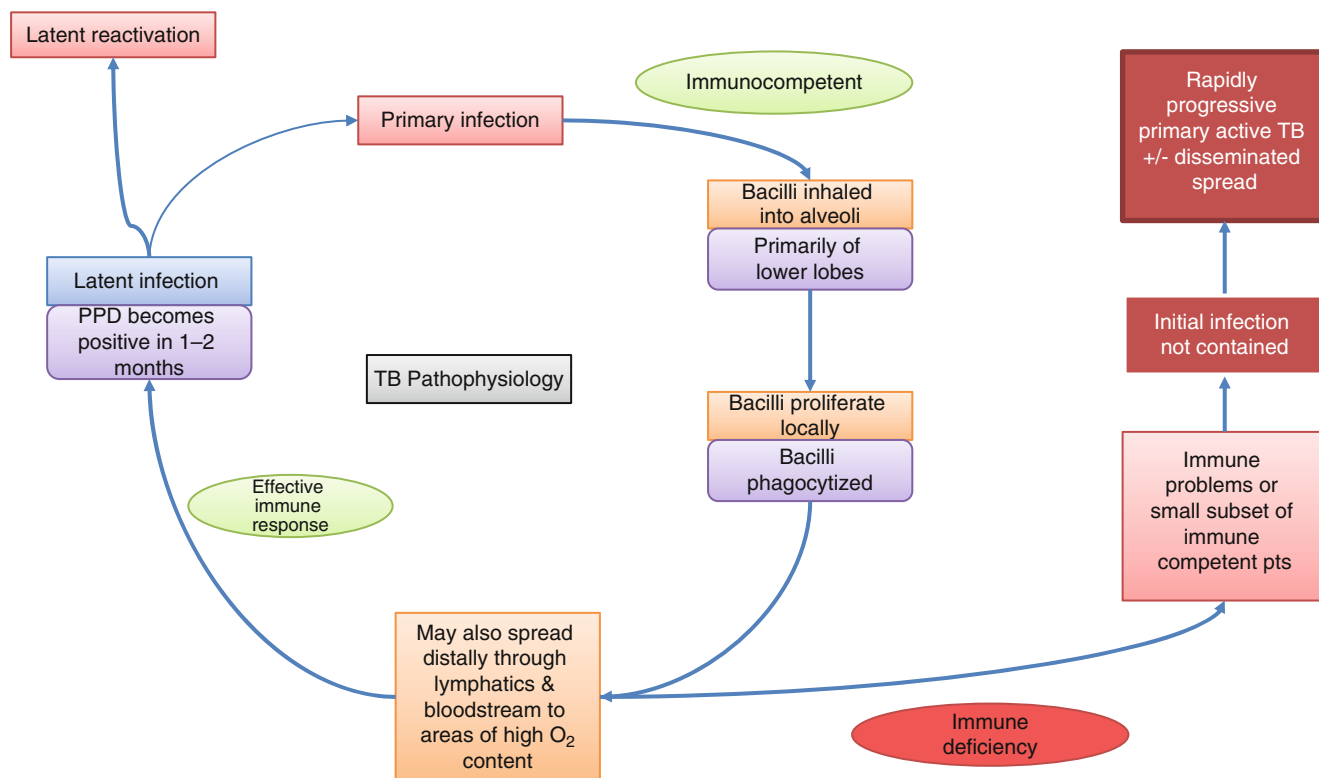
graph TD
    AM[Aspiration Management] --> W[Witnessed?]
    W --> SA[Suction airway]
    W --> N[No evidence that corticosteroids improve outcomes]
    N --> IP[Intubate pt]
    IP --> DST[Decompress stomach with gastric tube]
    W --> C[Concern for recurrent aspiration?]
    C --> IP
    C --> T[Treat]
    S[Steroids?] --> N
    Wz[Wheezing?] --> B[Bronchodilators]
    PA[Prophylactic antibiotics?] --> NI[NOT indicated for pneumonitis]
    WTP[When to treat aspiration for PNA?] --> F[Fever]
    WTP --> PC[Productive cough]
    WTP --> NIC[New infiltrate on CXR]
    AC[Aspiration in community?] --> CCP[Coverage for CAP pathogens]
    CCP --> SHI[S. pneumoniae  
H. influenzae]
    SHI --> ACov[Anaerobic coverage]
    AHC[Aspiration in health care setting?] --> CHCP[Coverage for HCAP pathogens]
    CHCP --> PSA[Pseudomonas  
S. aureus]
    PSA --> ACov
    AdC[Admission criteria] --> CI[Chronically ill]
    AdC --> NHR[Nursing home residents]
    AdC --> NICX[New infiltrate on CXR]
    AdC --> H[Hypoxemia]
    AdC --> PS[Persistent Sx]
    RA[Reliable & asymptomatic?] --> O[Observe x 1 hour]
    O --> SRP[Strict return precautions  
Dyspnea  
Cough  
Fever]
    O --> NPA[NO prophylactic antibiotics]
    PS --> D[Dyspnea]
    PS --> C[Cough]
    PS --> T[Tachypnea]
    PS --> W[Wheezing]
  
```

Tuberculosis

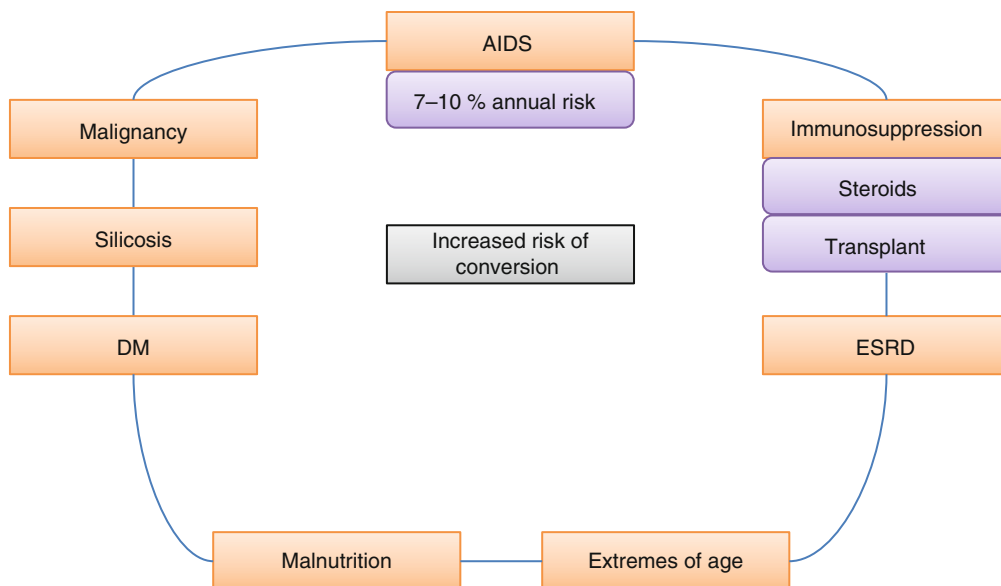
TB Tidbits



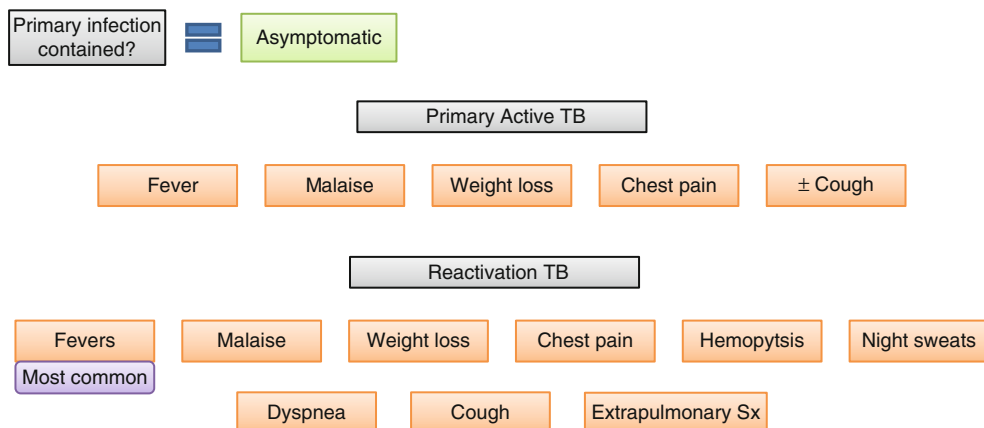
TB Pathophysiology



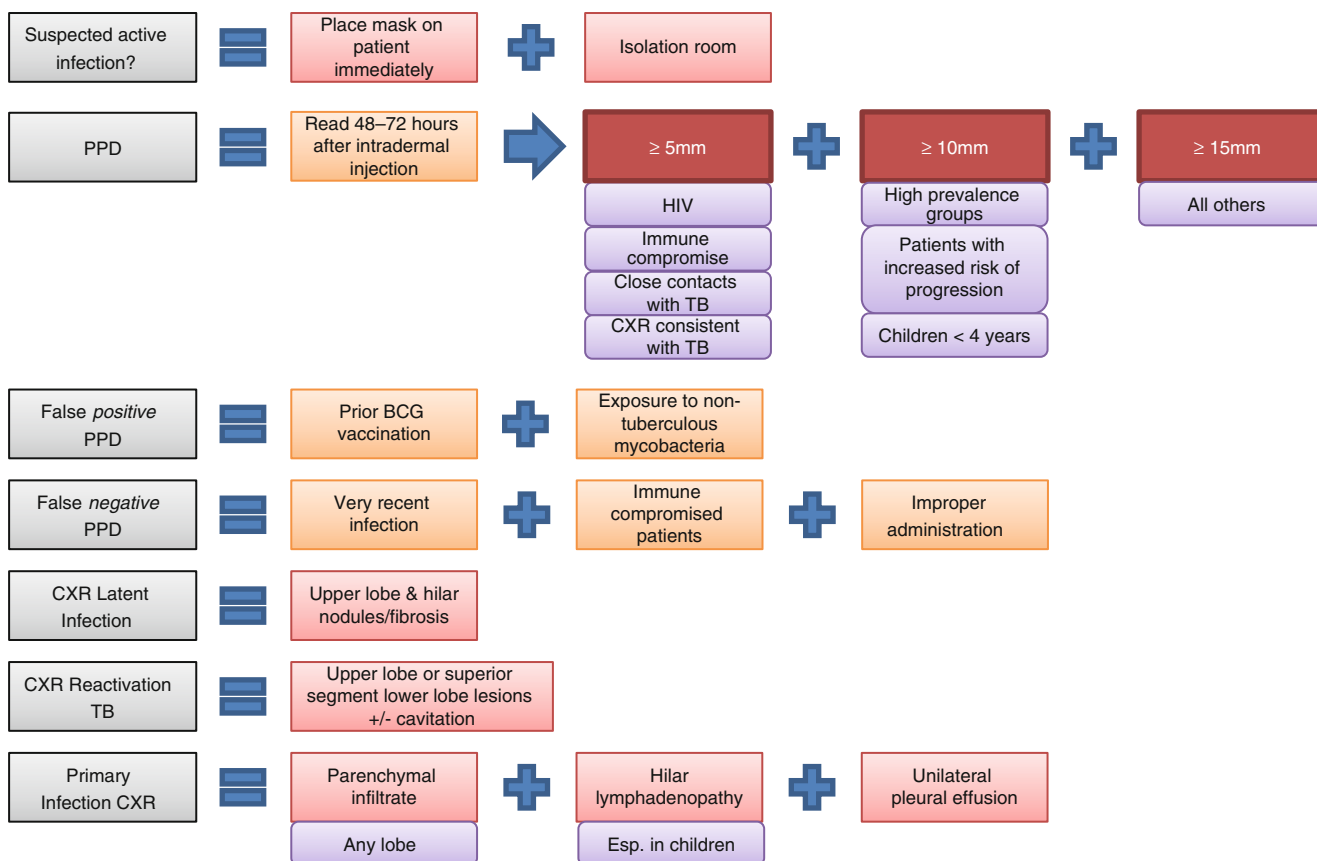
Reactivation TB



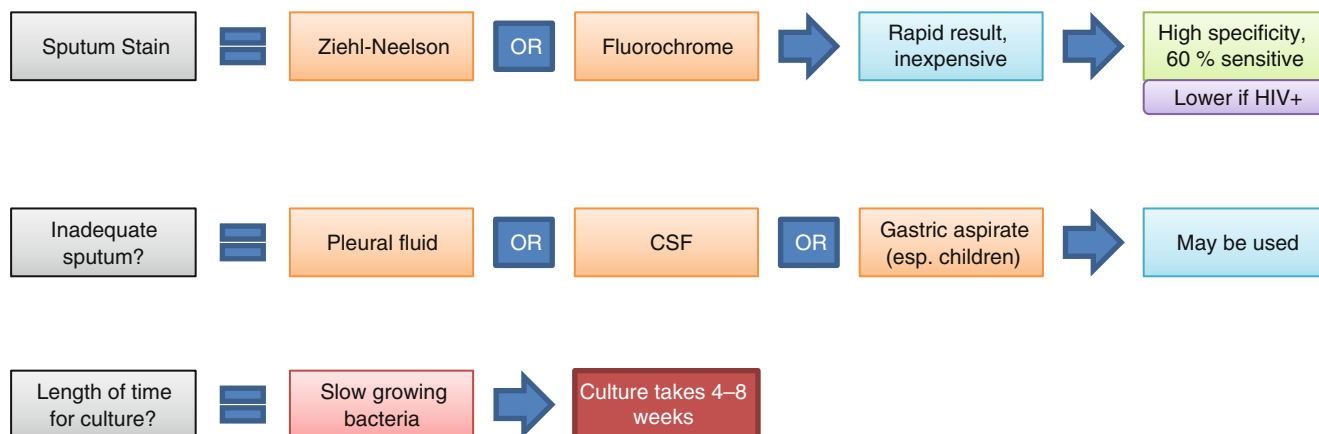
TB Presentation



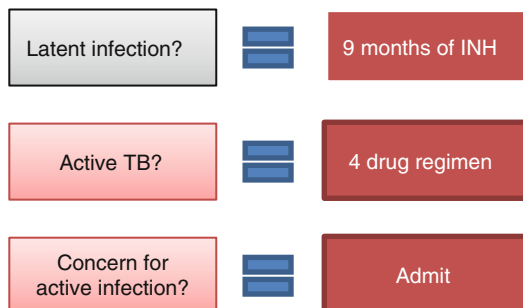
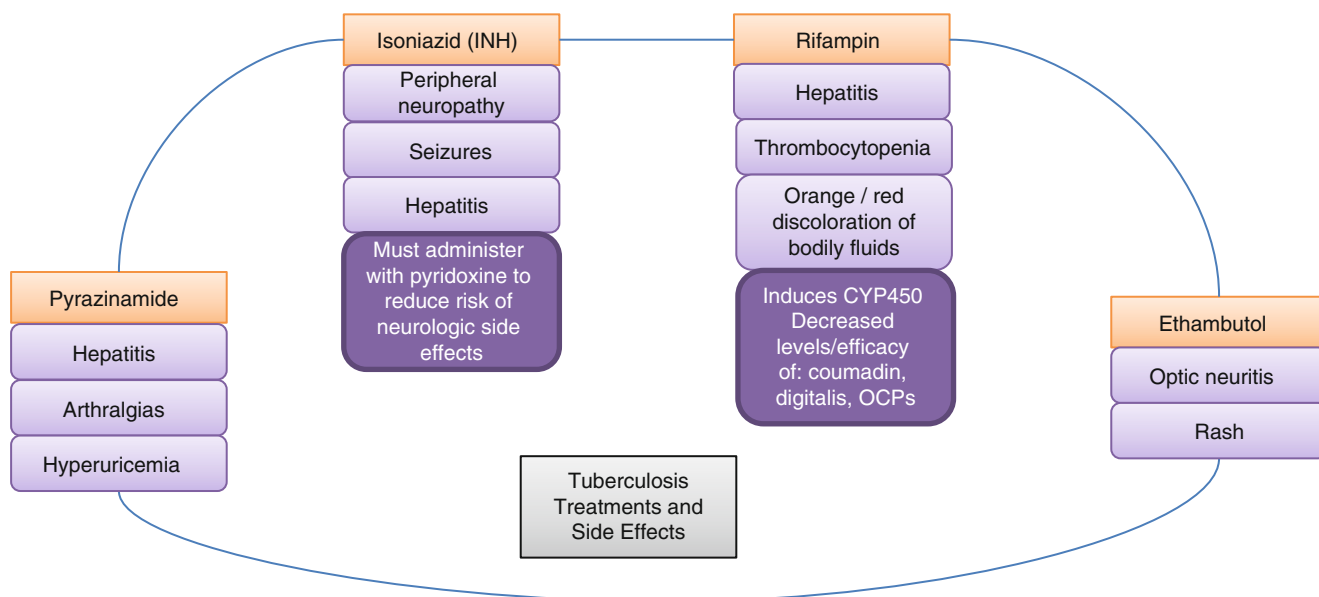
TB Initial Evaluation: PPD and CXR



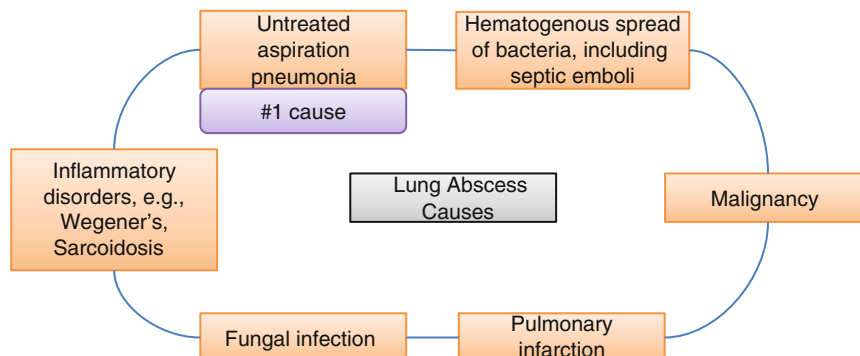
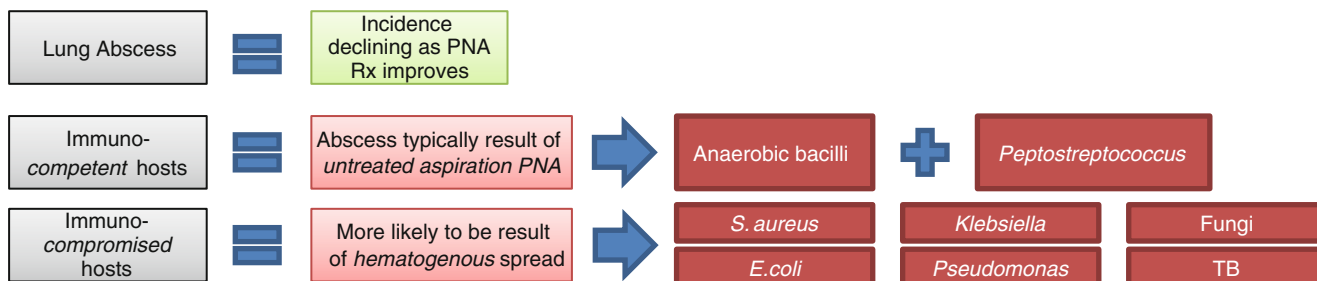
TB Diagnosis



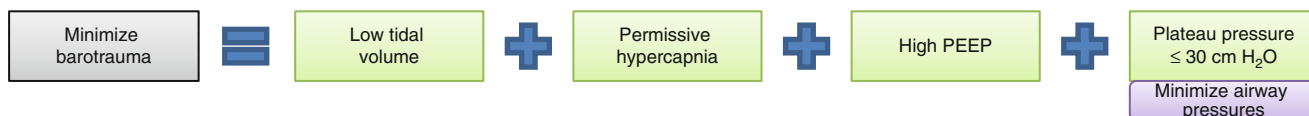
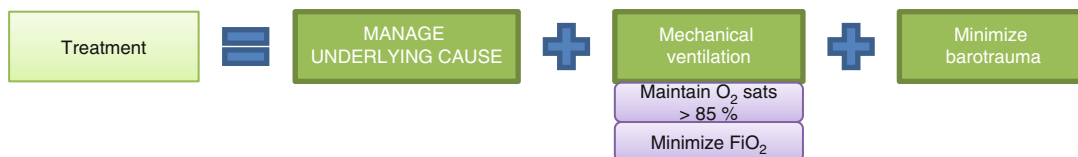
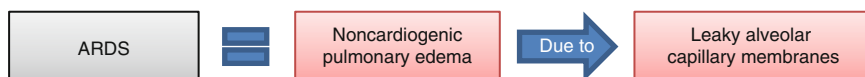
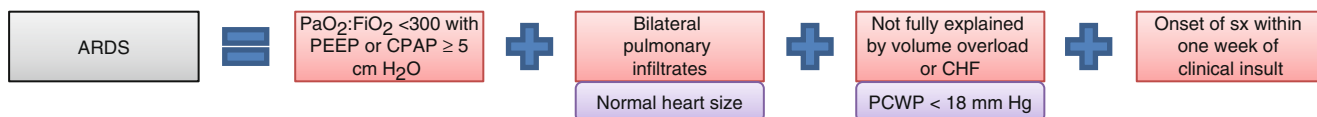
Tuberculosis Treatments and Side Effects



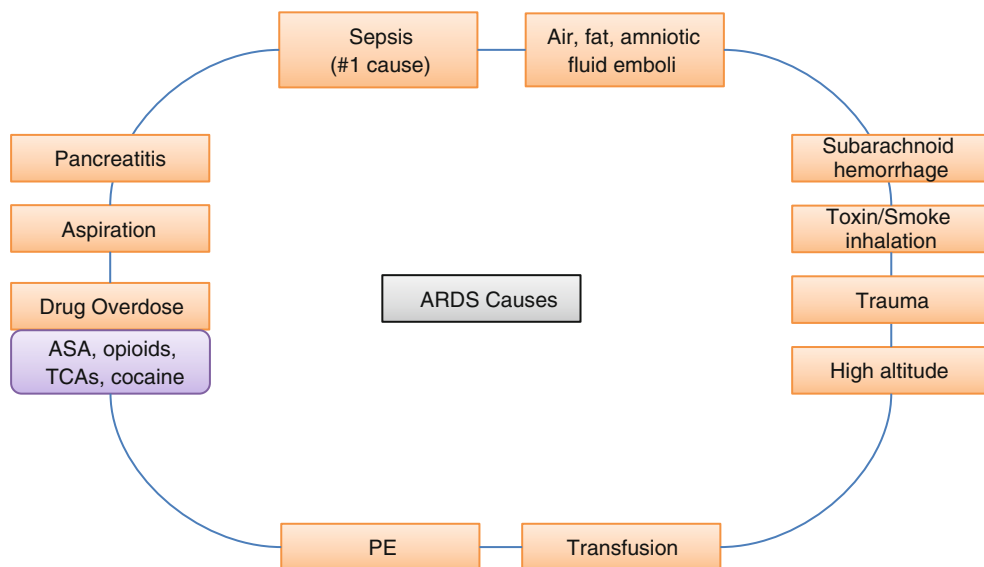
Lung Abscess



Acute Respiratory Distress Syndrome

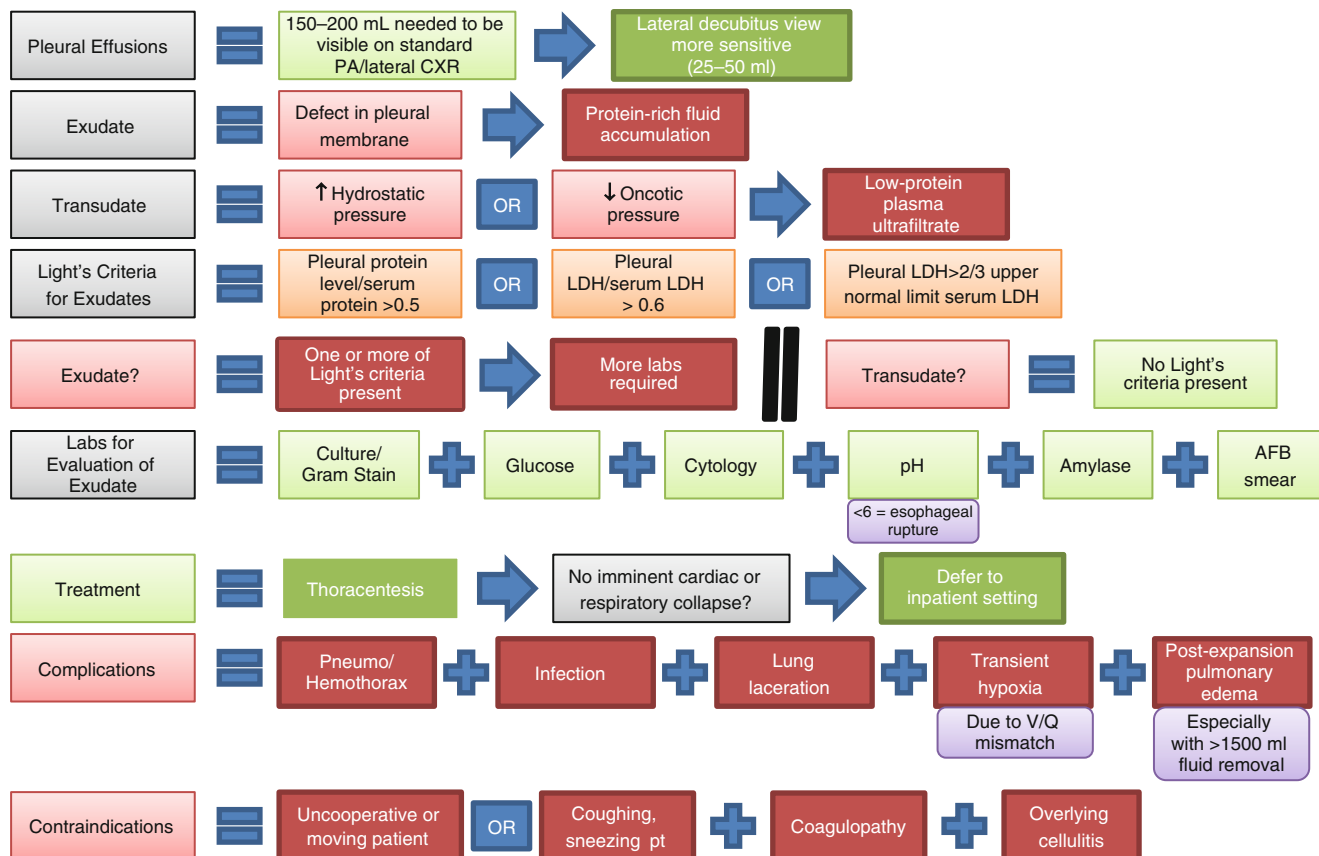


ARDS Causes

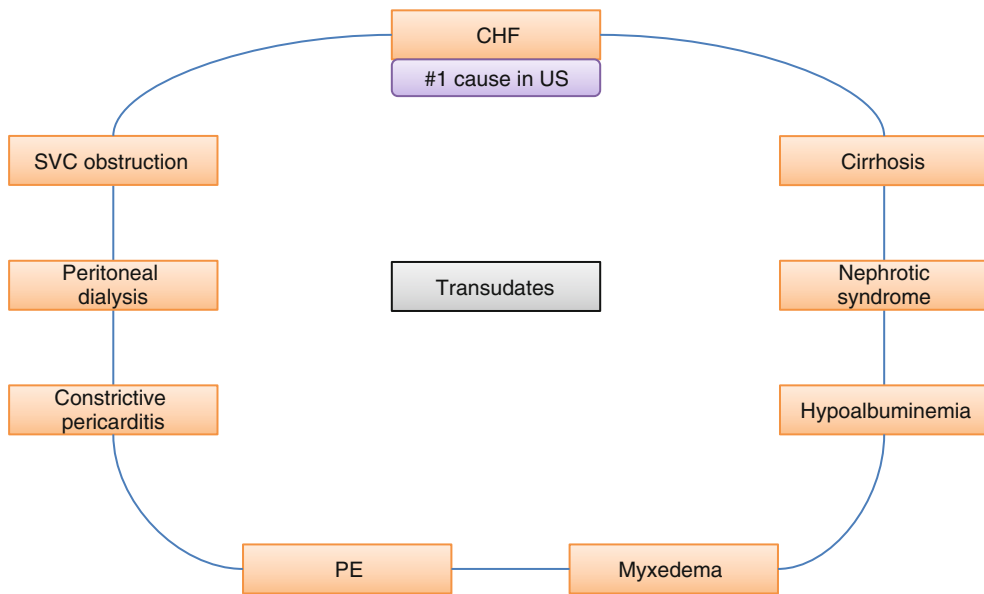


Pleural Effusions

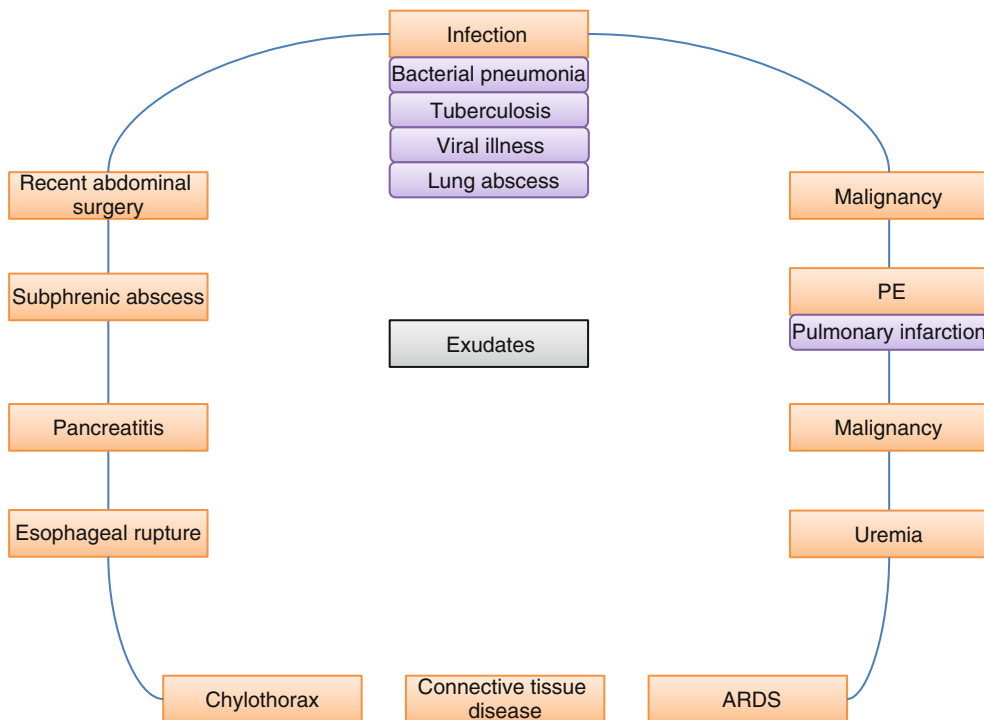
Introduction



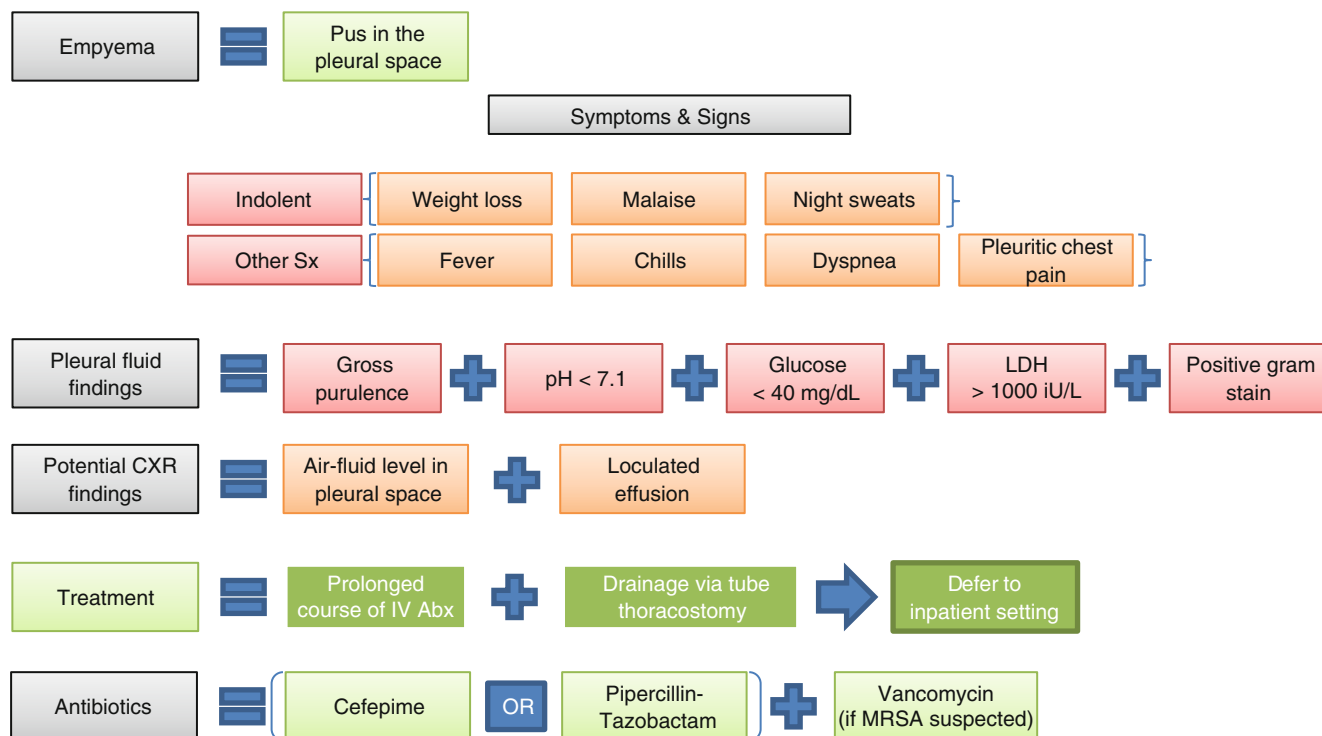
Transudates



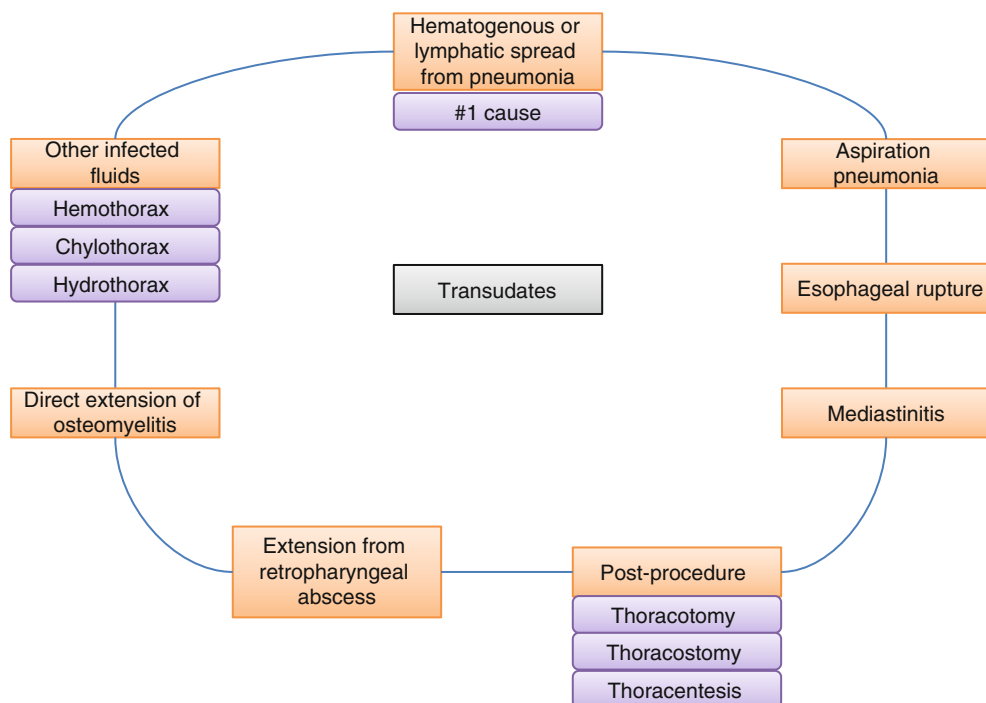
Exudates



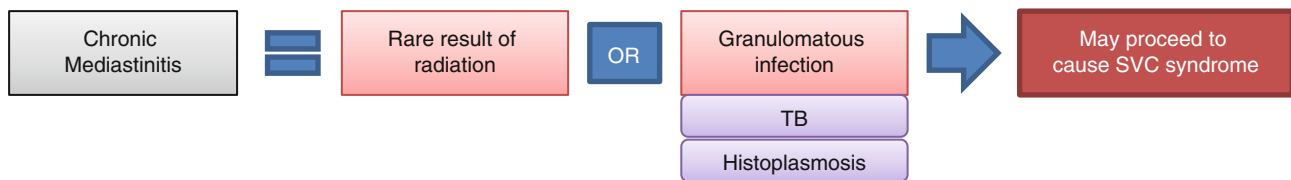
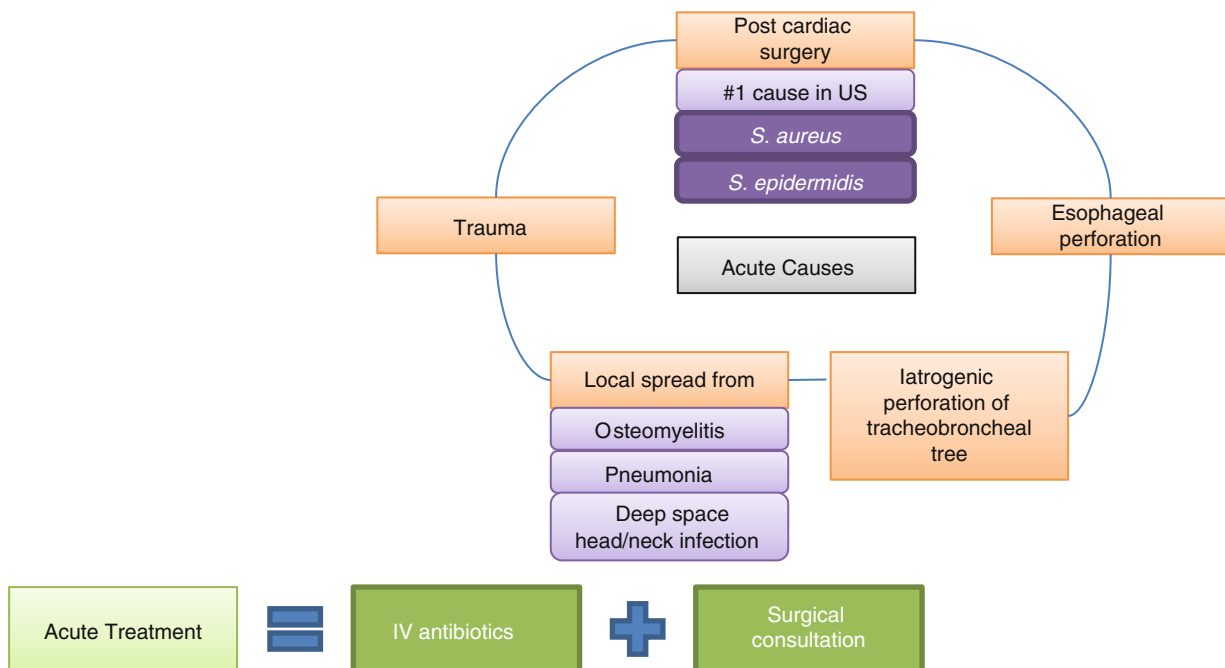
Empyema



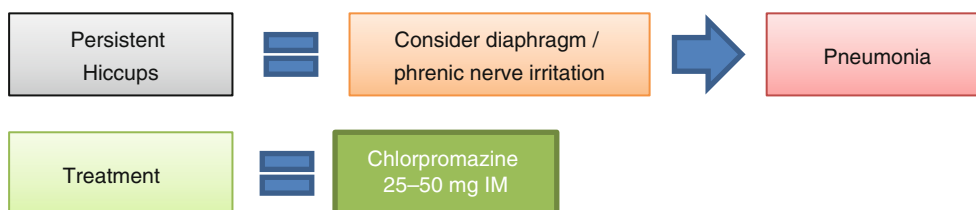
Causes of Empyema



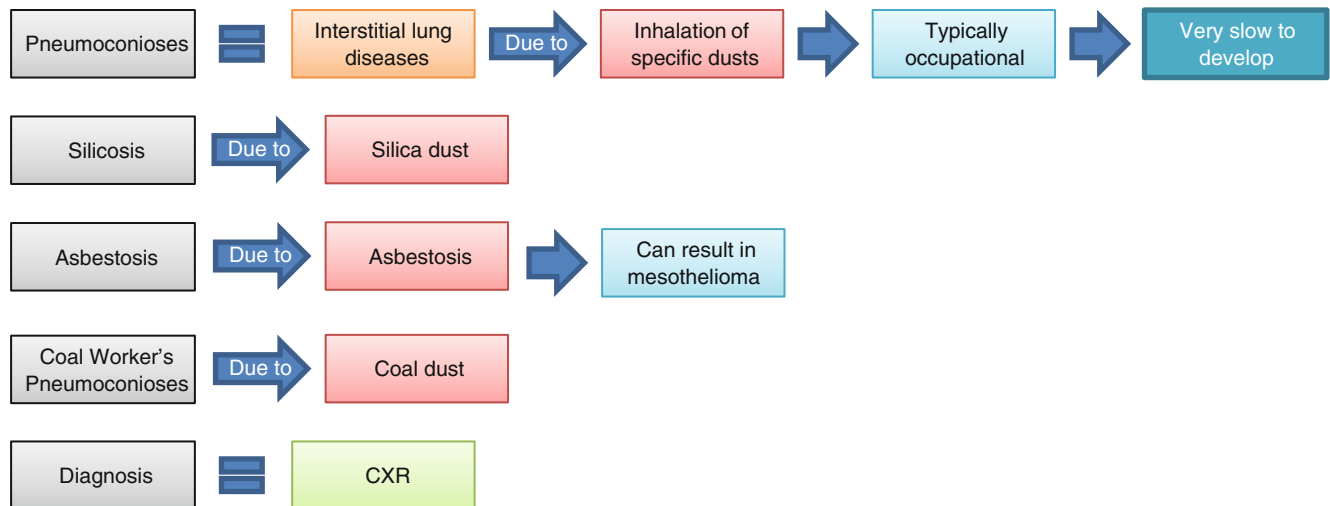
Mediastinitis



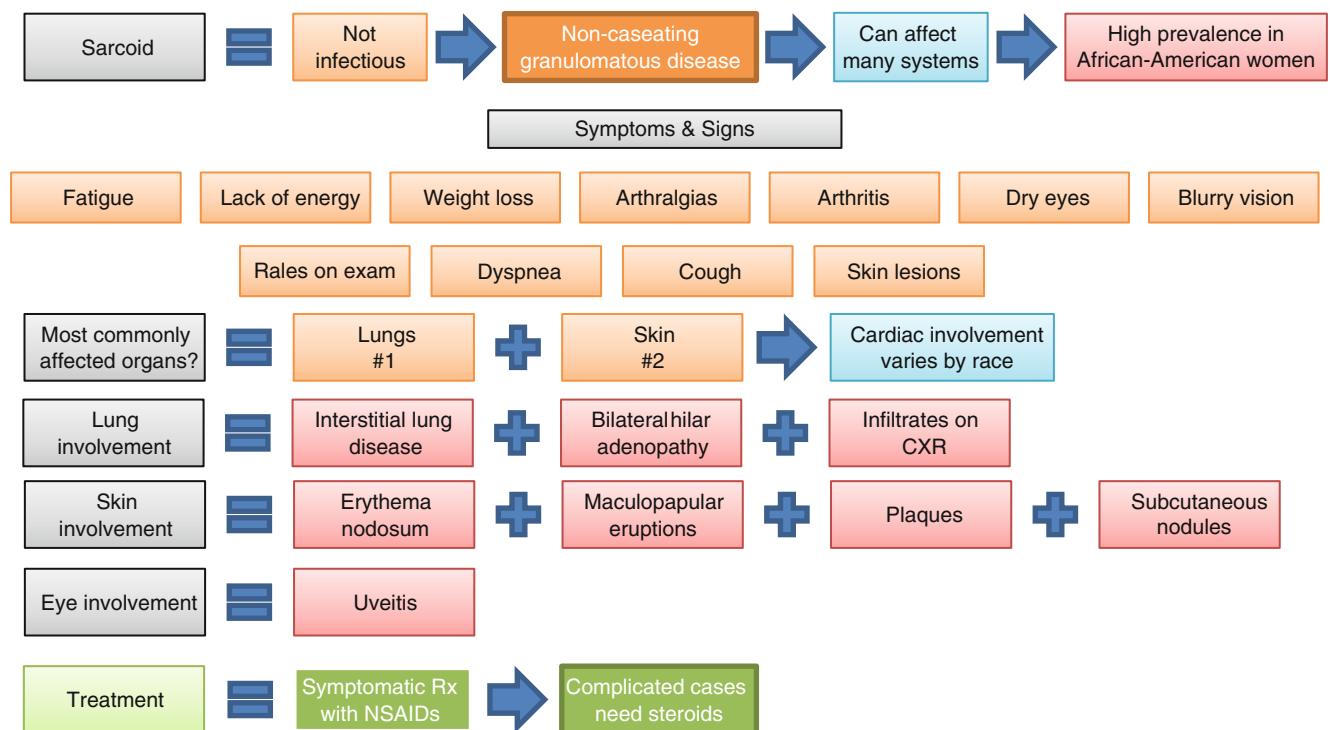
Hiccups



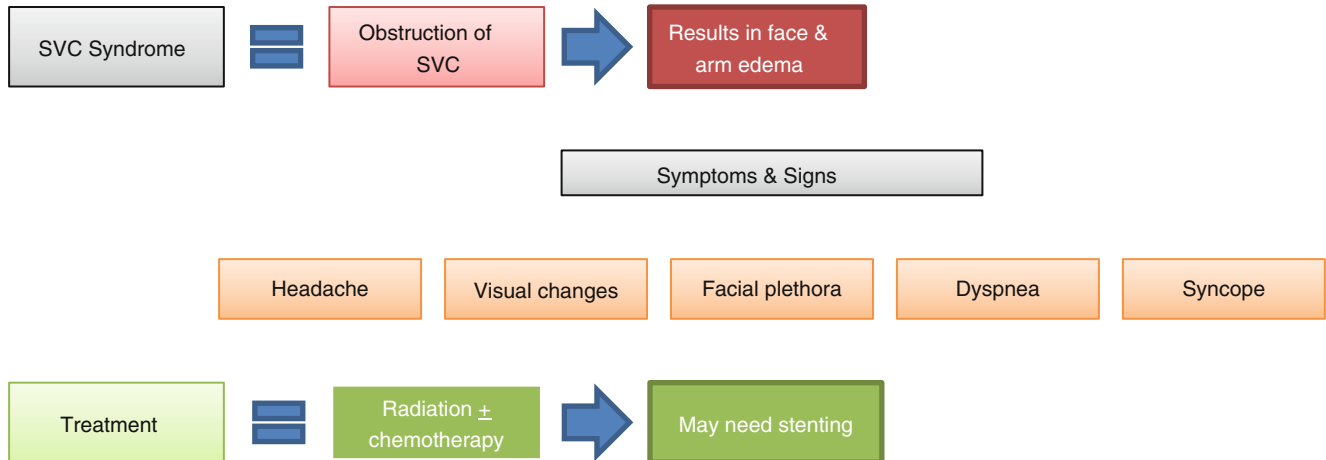
Pneumoconioses



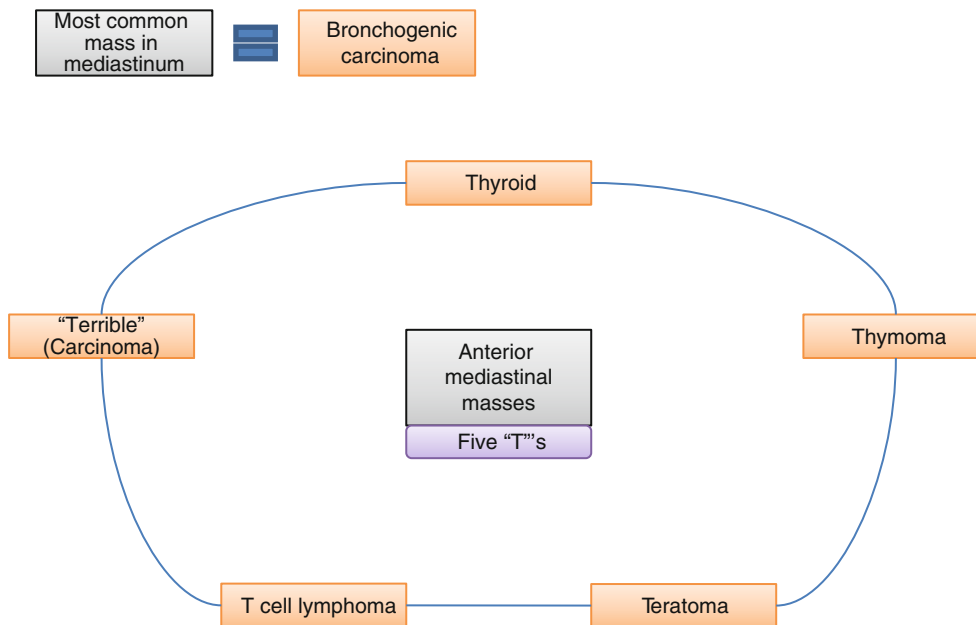
Sarcoid



Superior Vena Cava (SVC) Syndrome

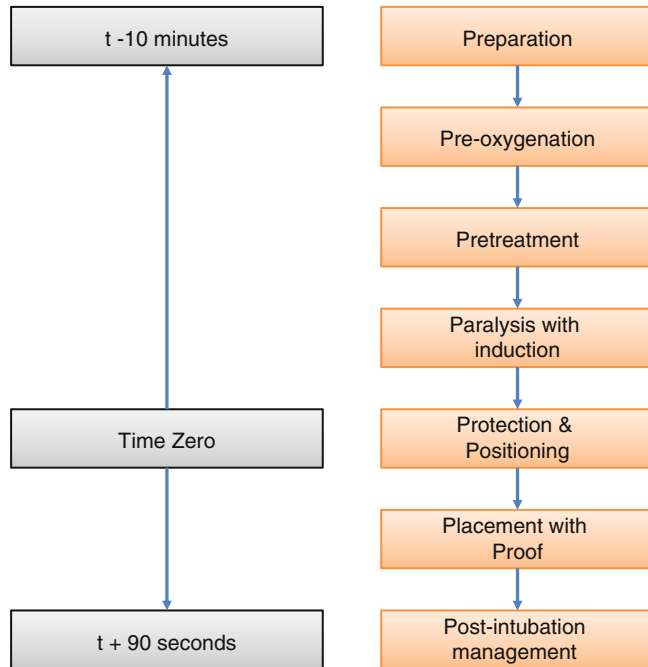


Mediastinal Masses

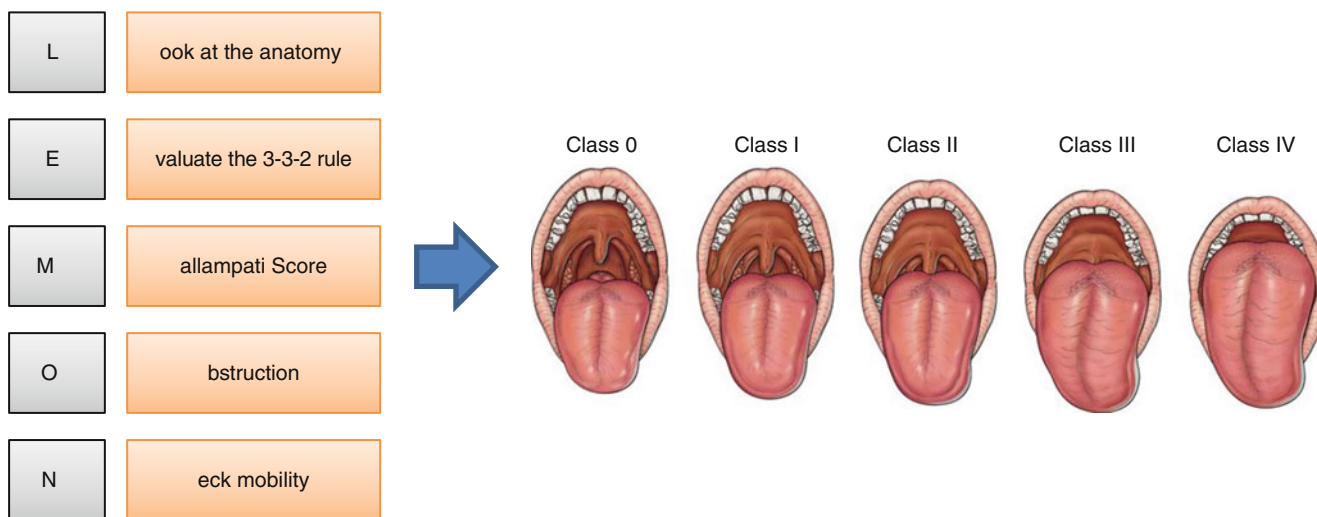
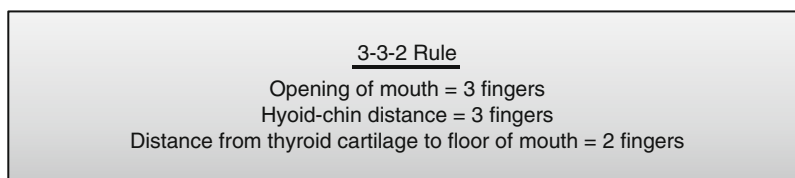


The Airway

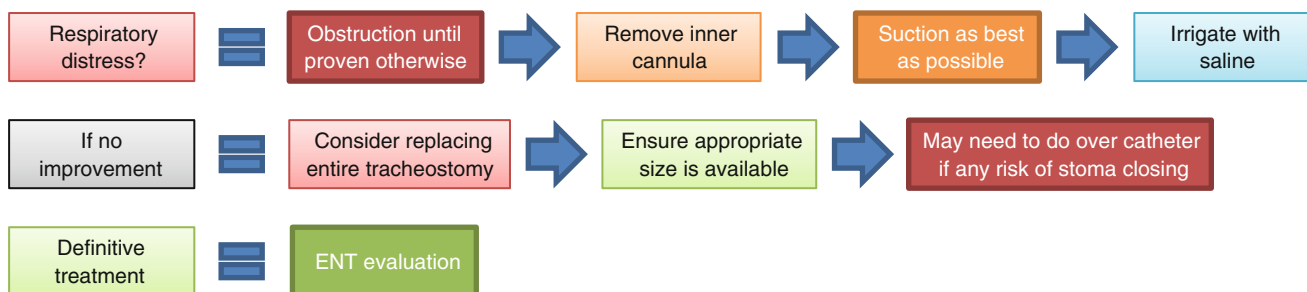
Rapid Sequence Intubation



Airway Tidbits



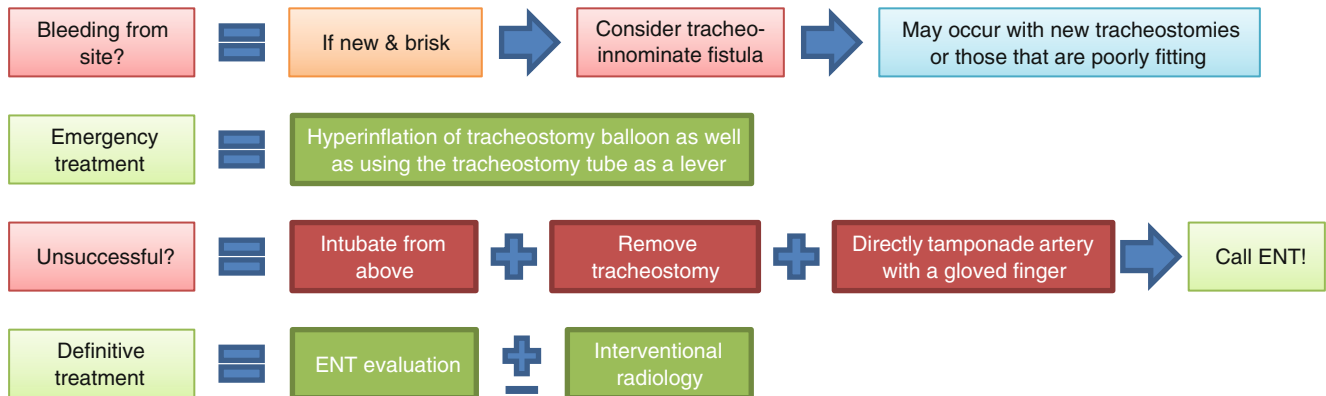
Tracheostomy and Respiratory Distress



(Reprinted from Ramachandran SK, Kheterpal S. The expected difficult airway. In: Glick DB, Cooper RM, Ovassapian A, editors. The difficult airway: an atlas of tools and techniques for clinical management.

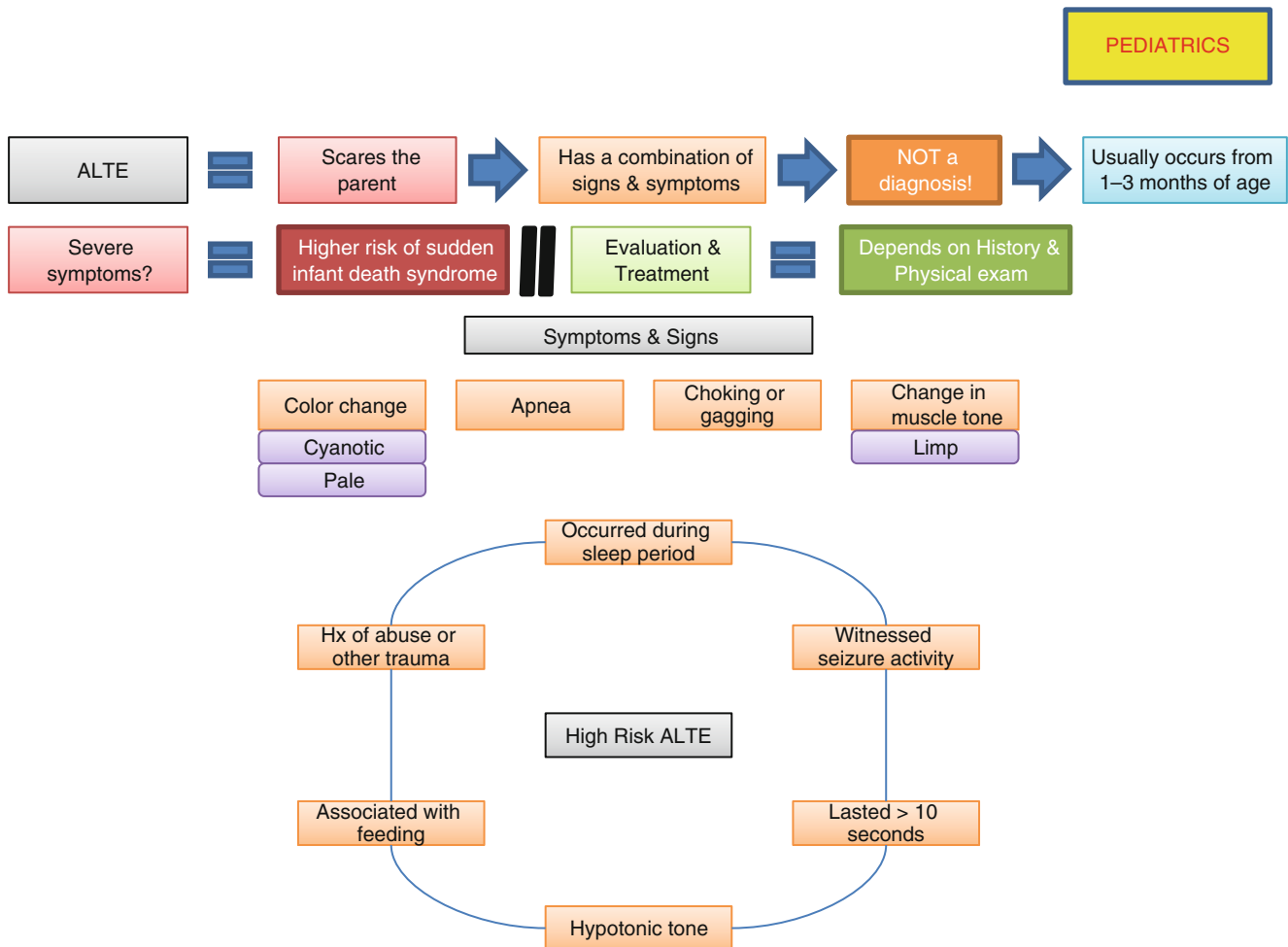
New York: Springer Science; 2013. p. 11–32. With permission from Springer Science + Business Media)

Tracheostomy and Bleeding

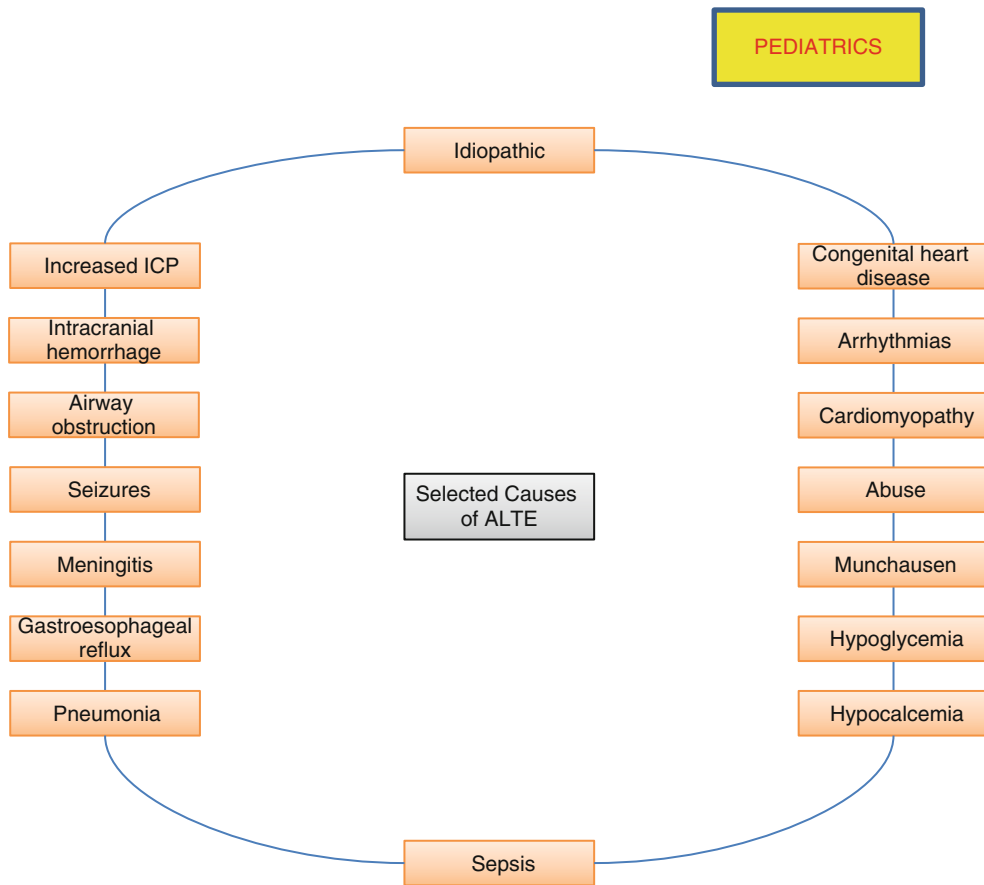


General Pediatrics

Apparent Life-Threatening Events (ALTE)

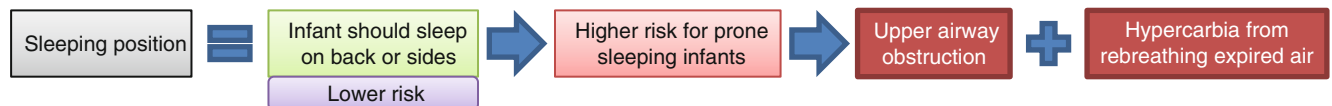
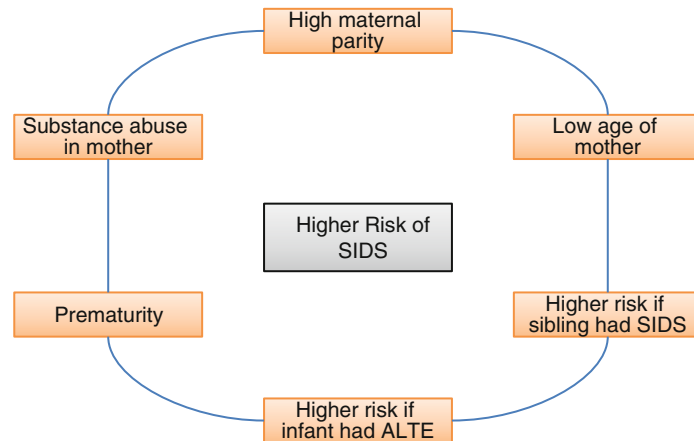


Selected Causes of ALTE



Sudden Infant Death Syndrome (SIDS)

PEDIATRICS



Gastroenterology

Brandon R. Allen and Bobby Desai

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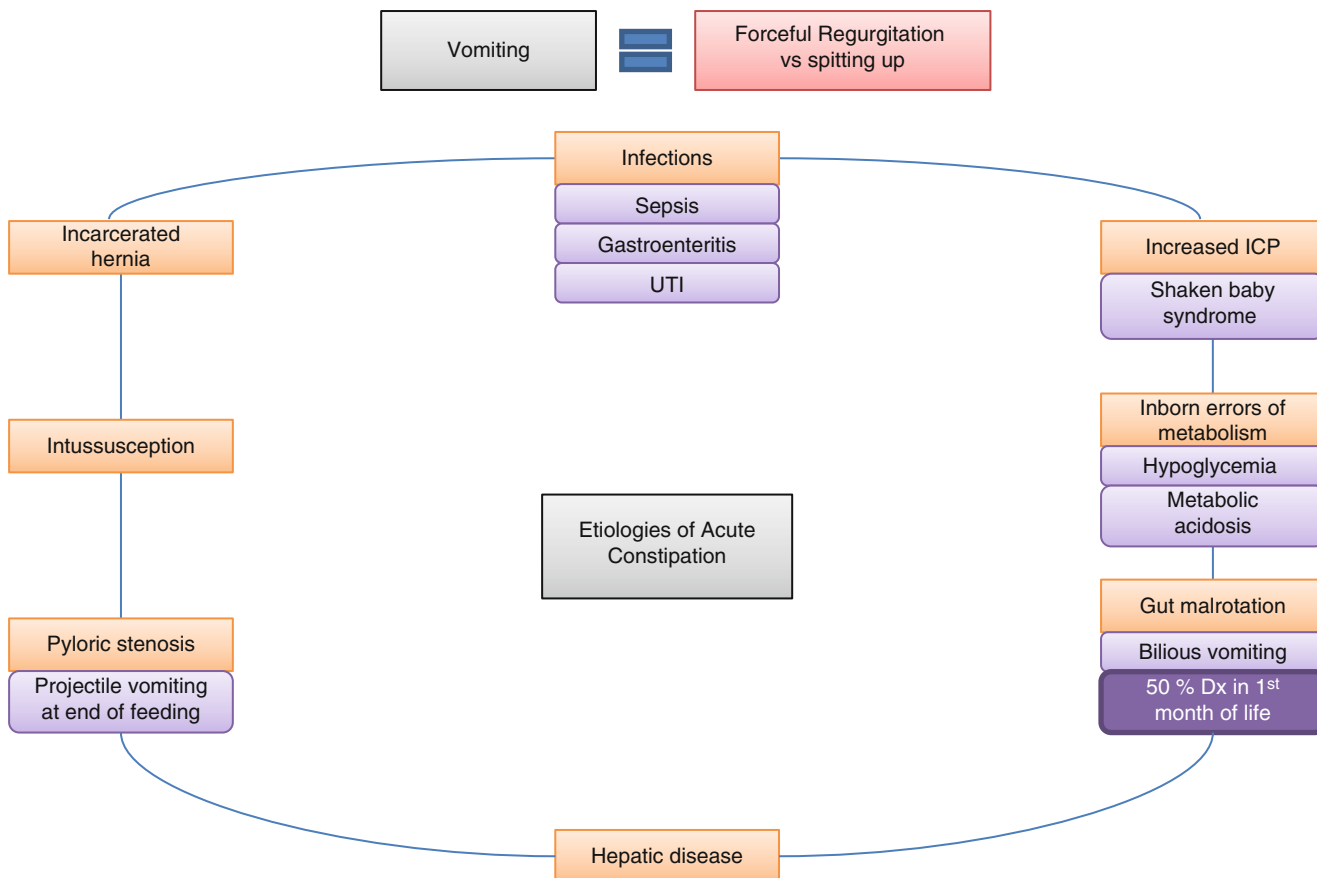
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University of Florida College of Medicine, Gainesville, FL, USA
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B. Desai, MD, MEd
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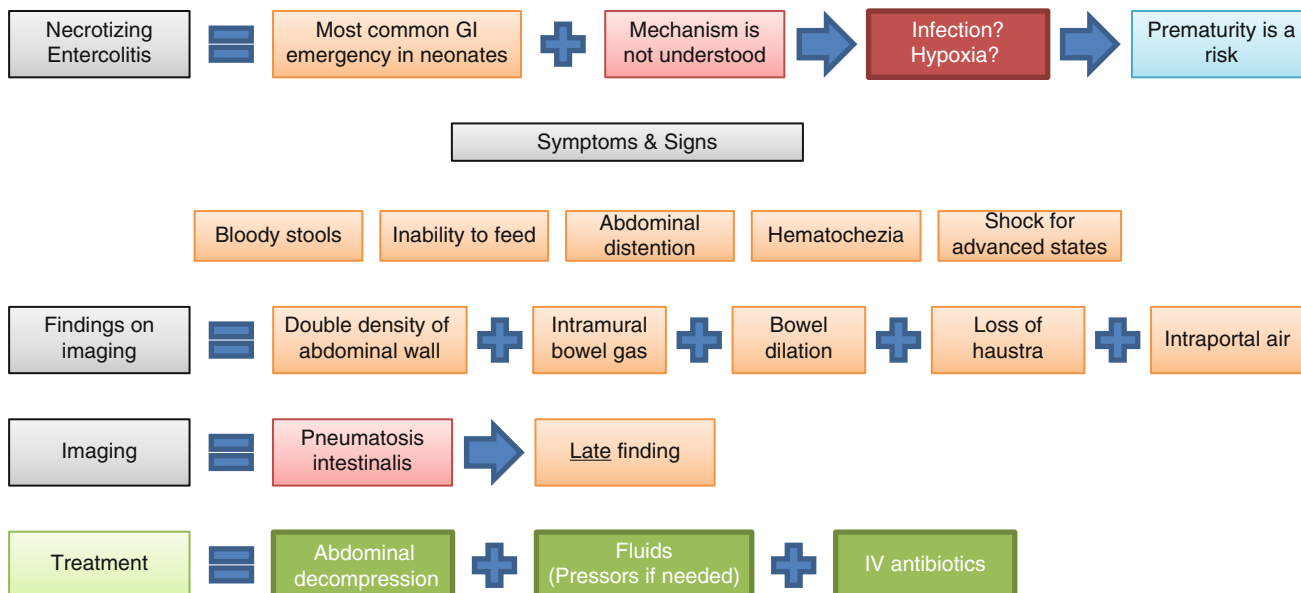
Pediatric Gastroenterology

Pediatric GI Tidbits: Vomiting

PEDIATRICS

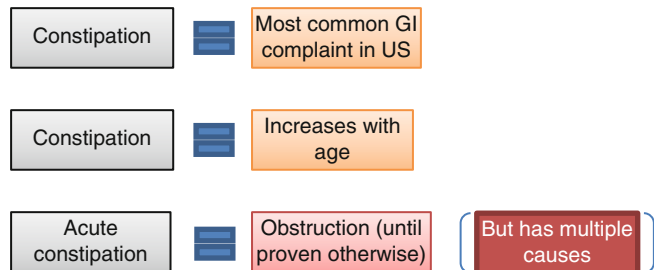


Necrotizing Enterocolitis

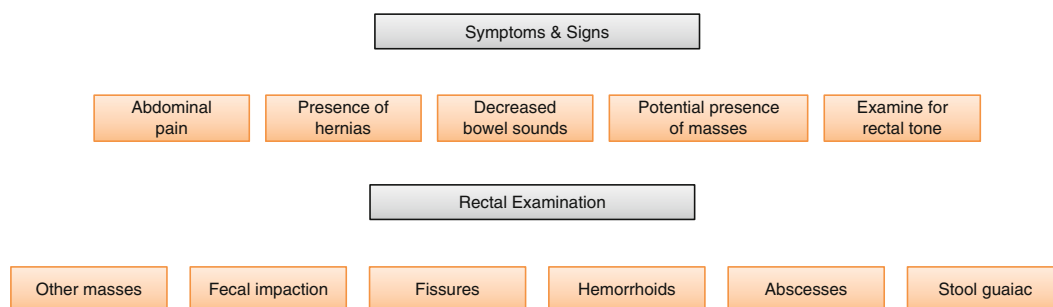


Constipation

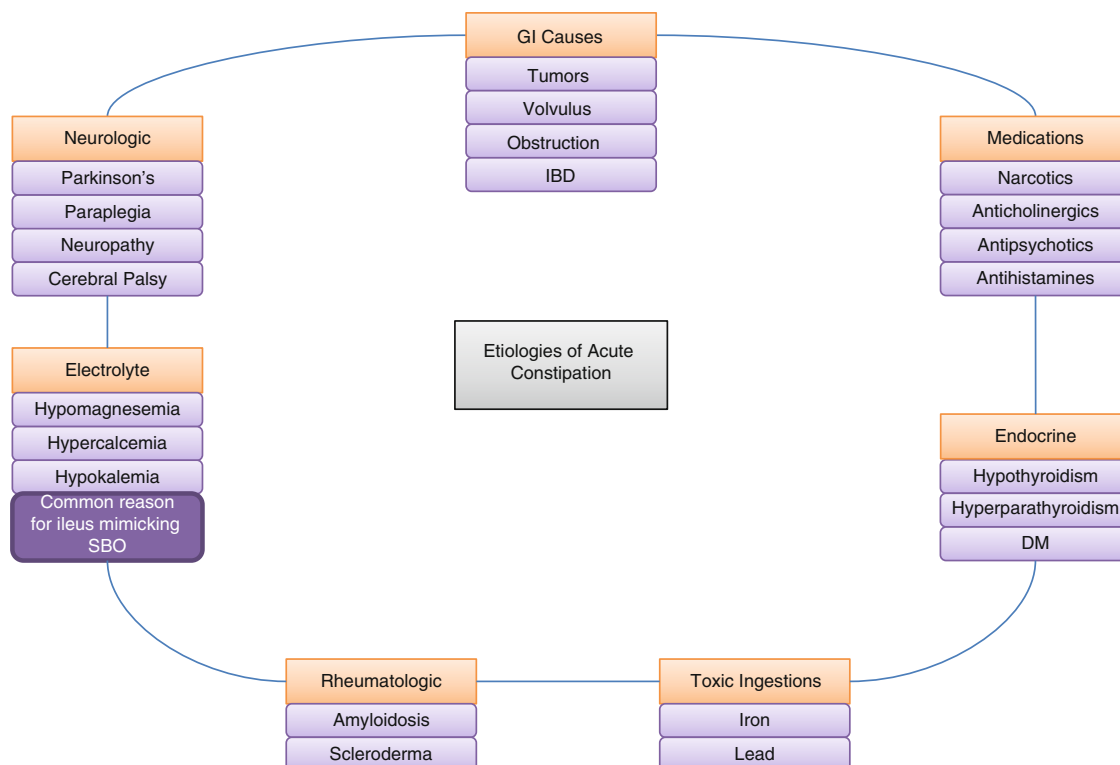
Introduction



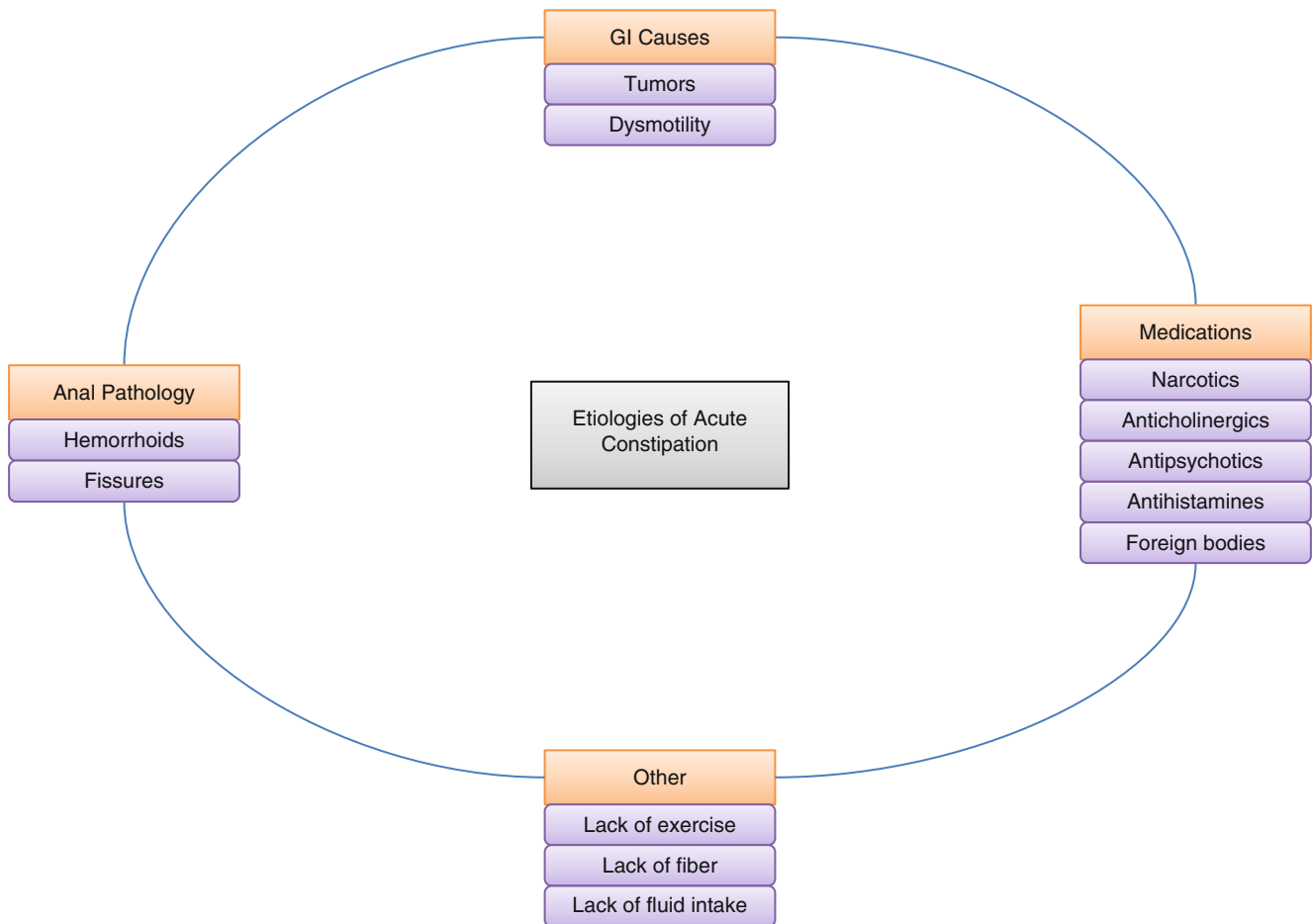
Symptoms and Signs



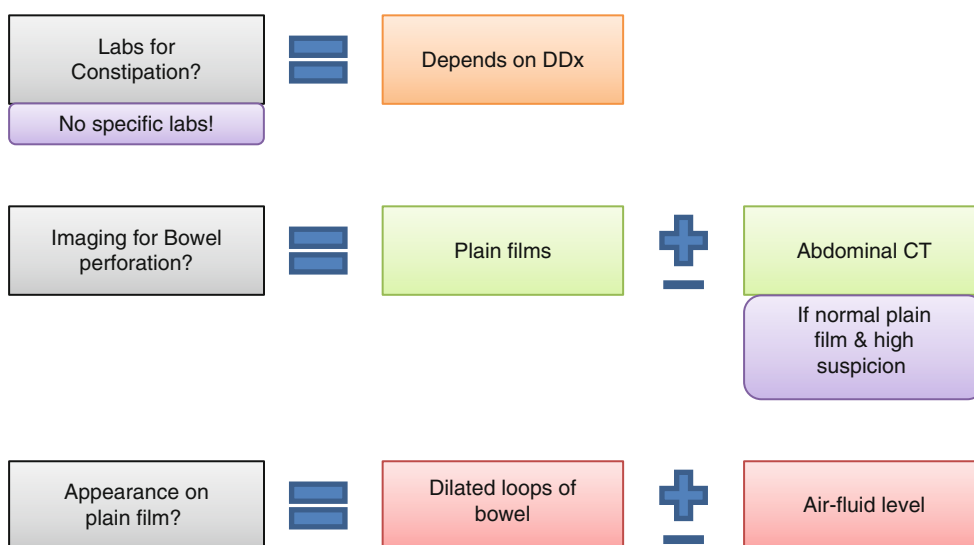
Etiologies of Acute Constipation



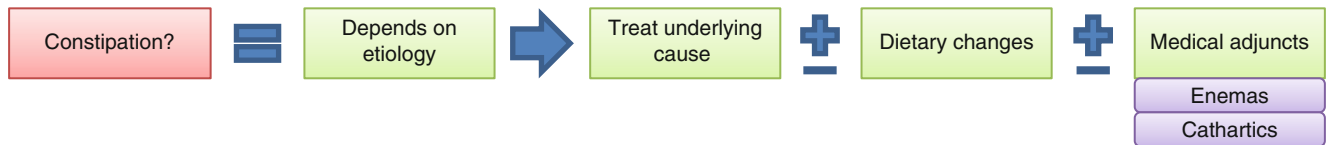
Etiologies of Chronic Constipation



Diagnosis

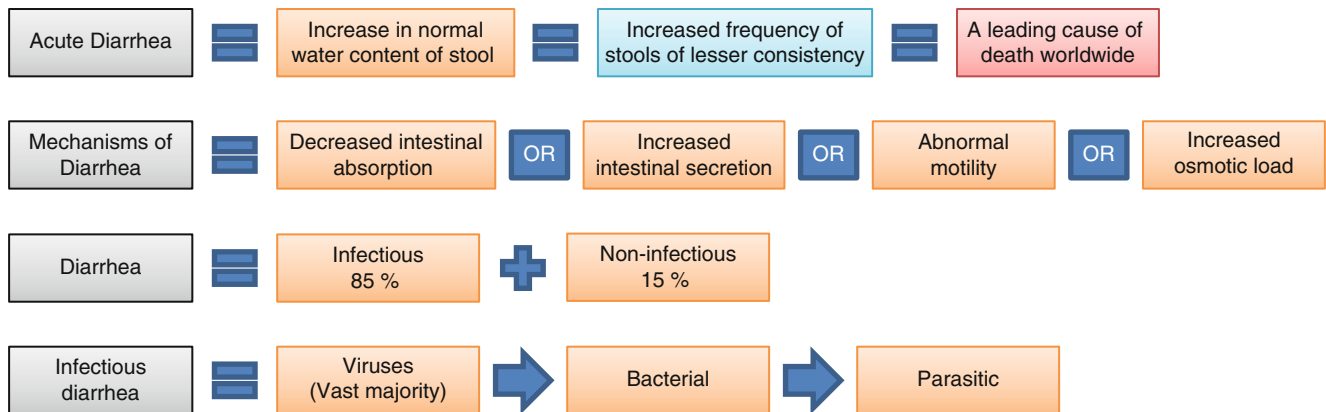


Treatment

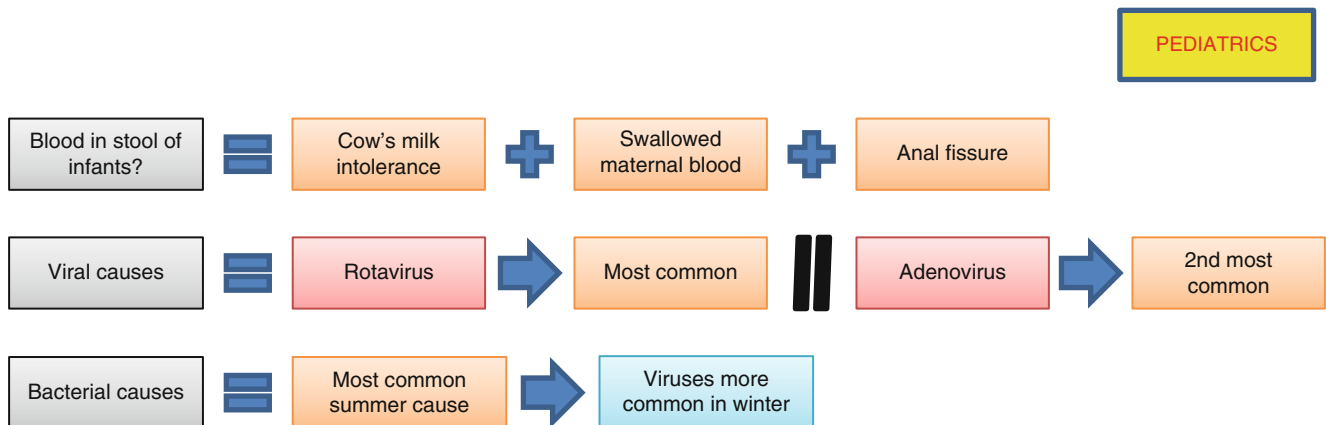


Diarrhea

Introduction

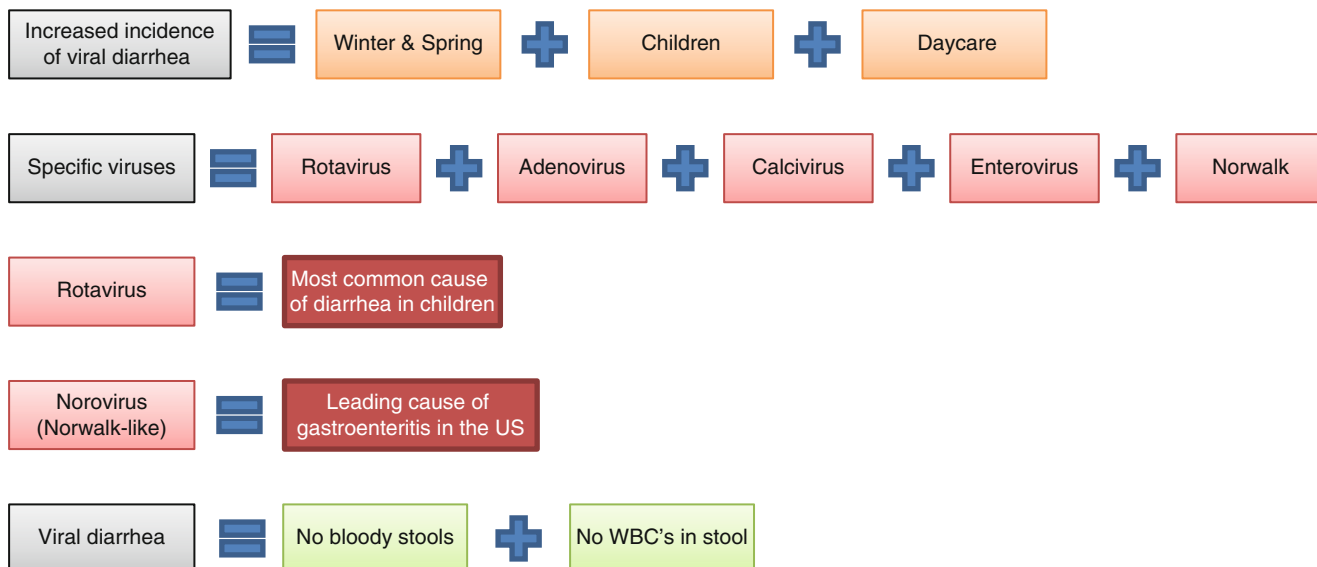


Pediatric GI Tidbits: Diarrhea

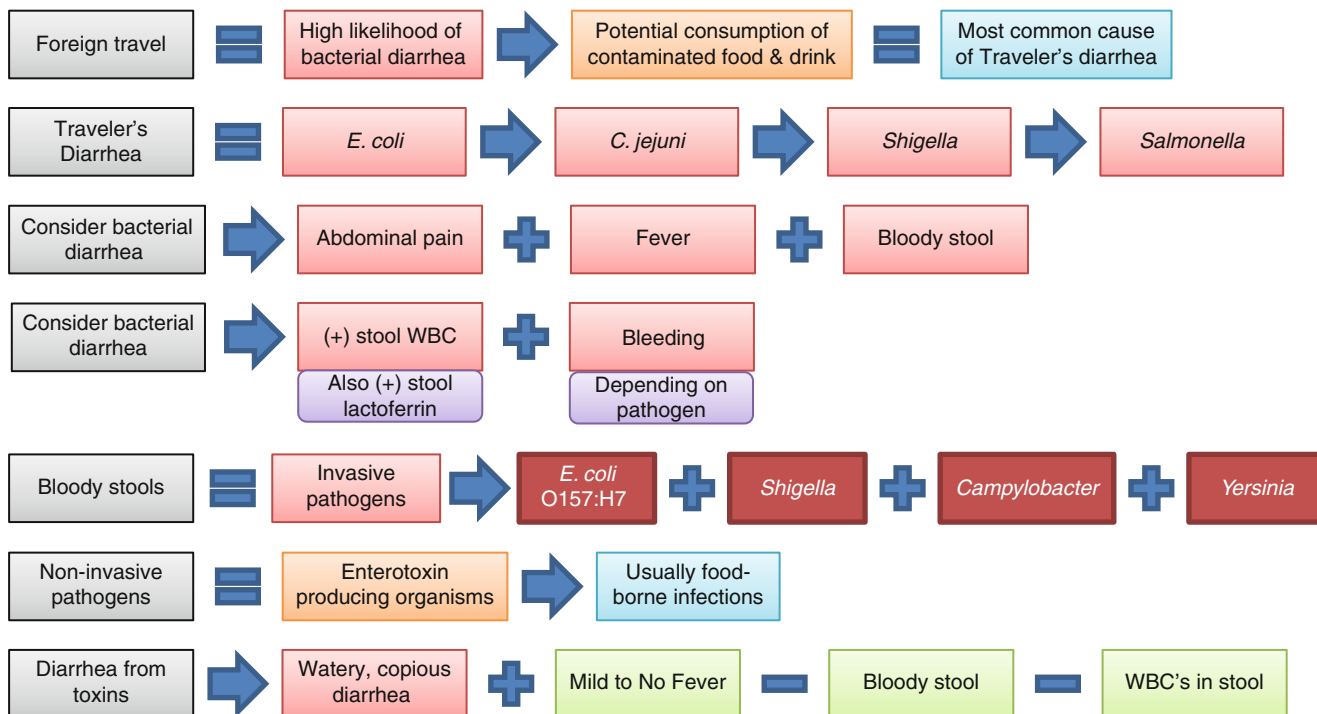


PEDIATRICS

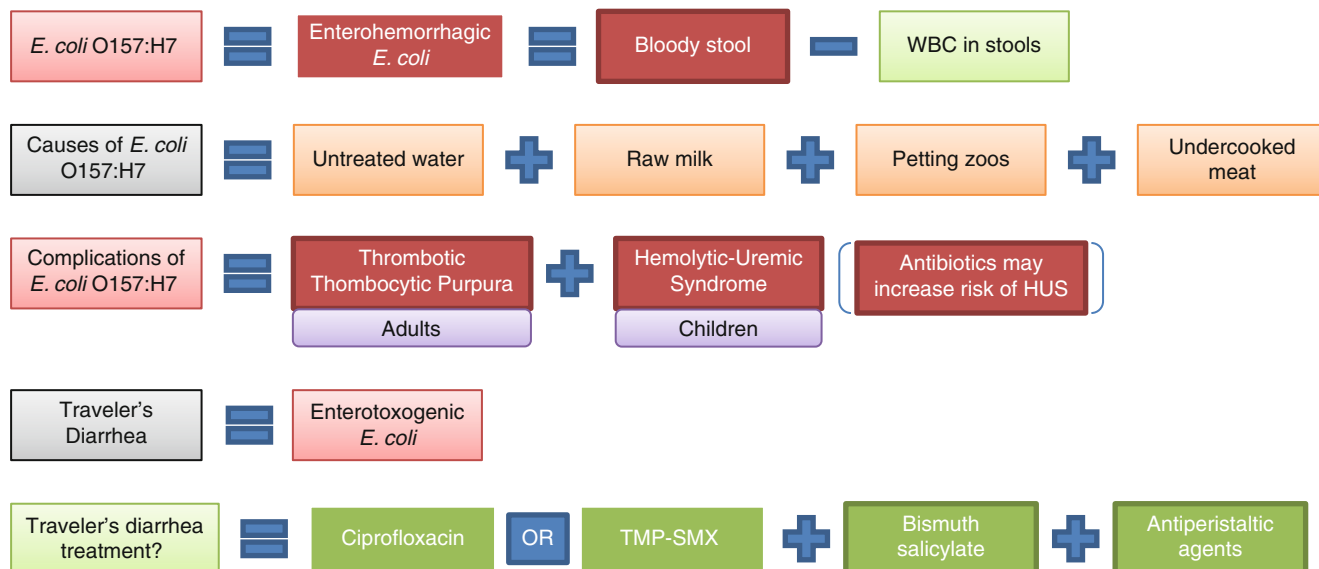
Viral Diarrhea



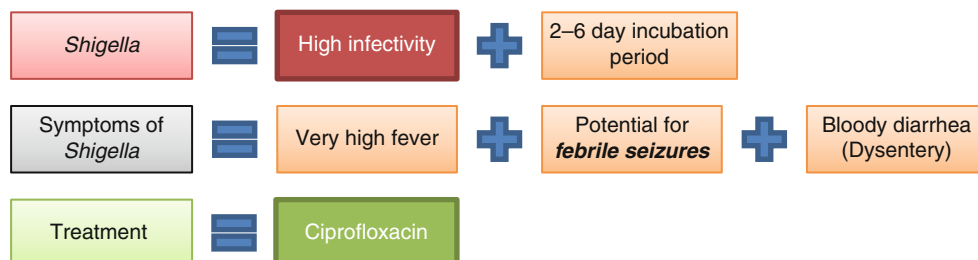
Bacterial Diarrhea



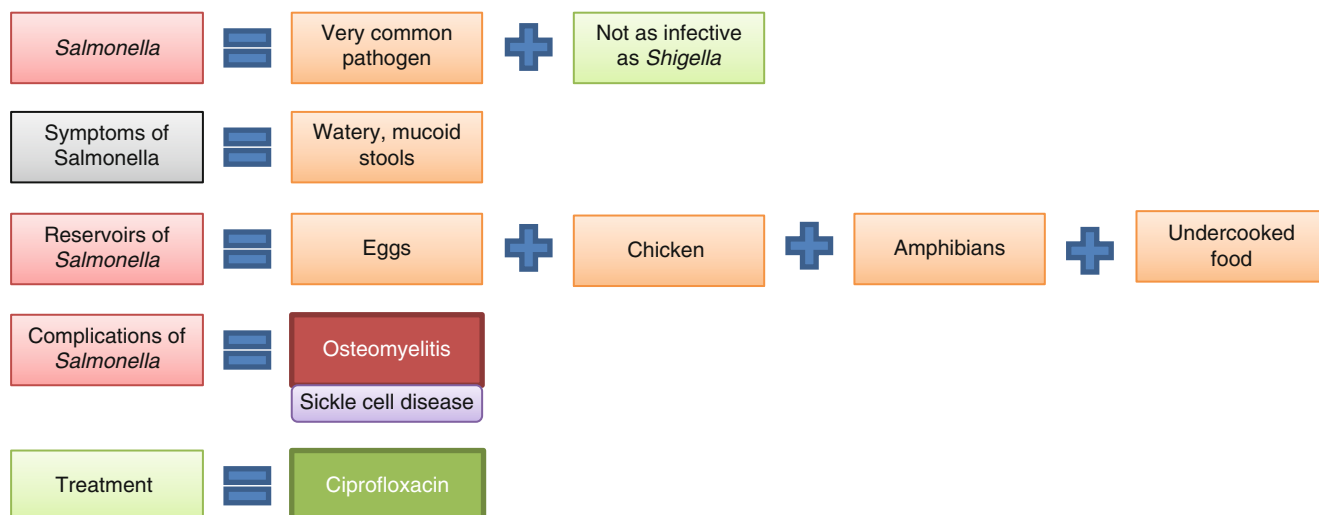
Specific Bacterial Pathogens: *E. coli*



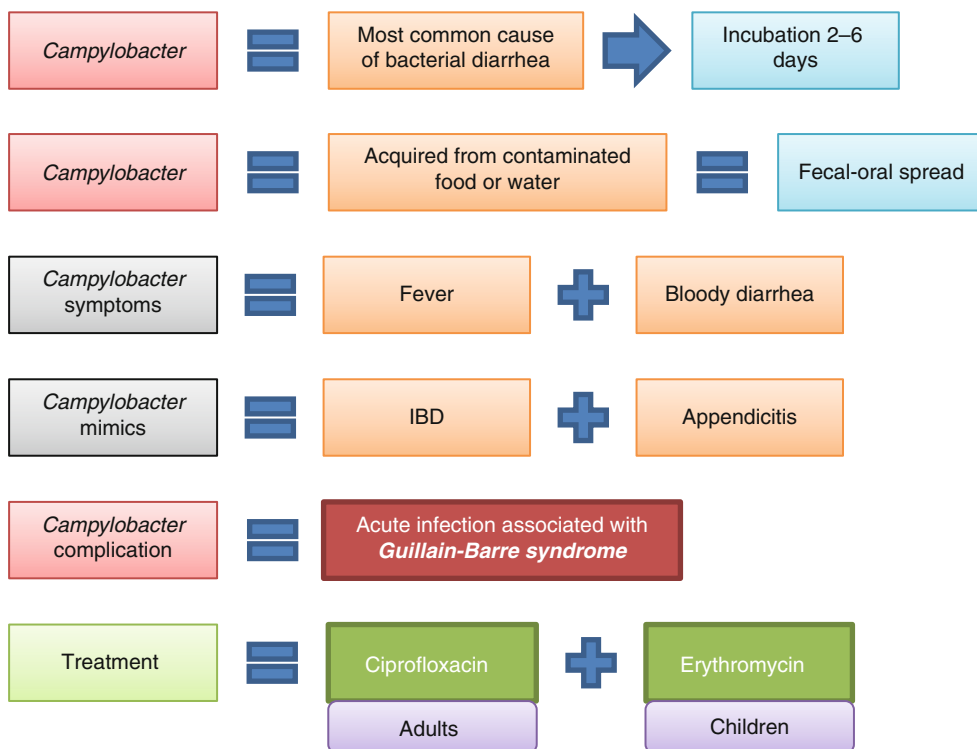
Specific Bacterial Pathogens: *Shigella*



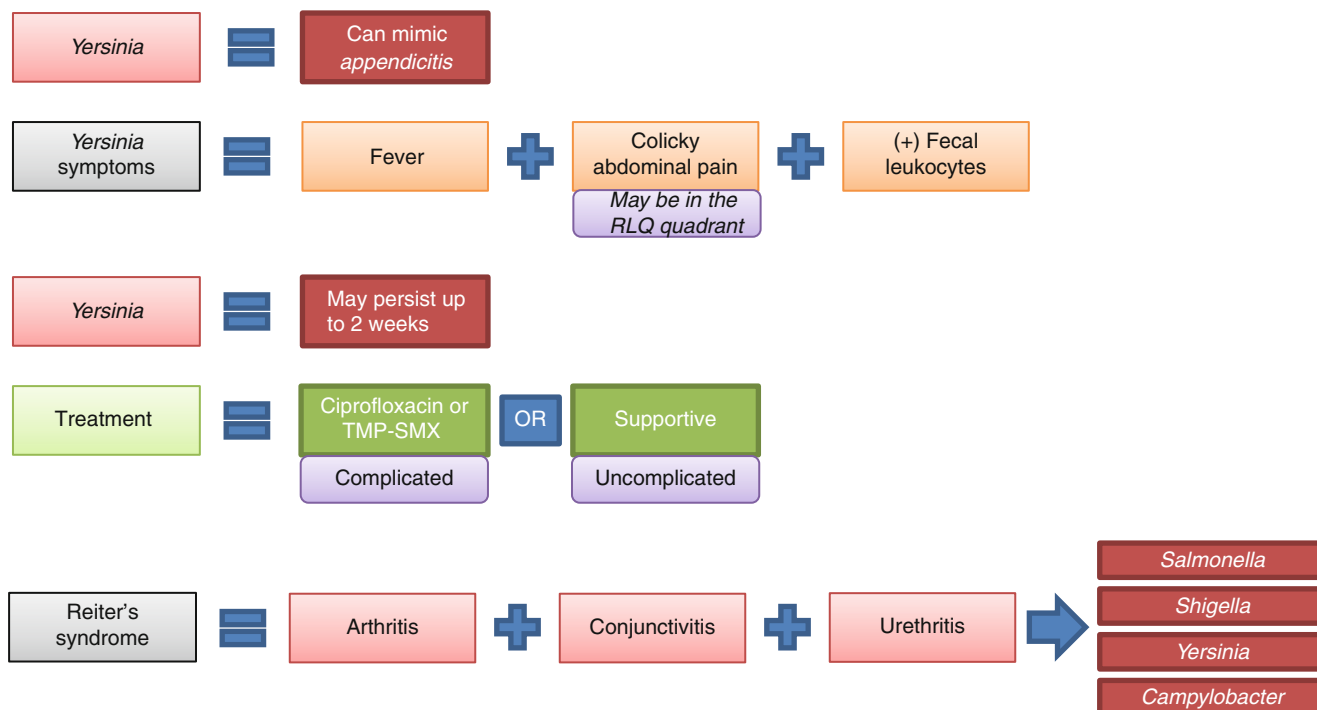
Specific Bacterial Pathogens: *Salmonella*



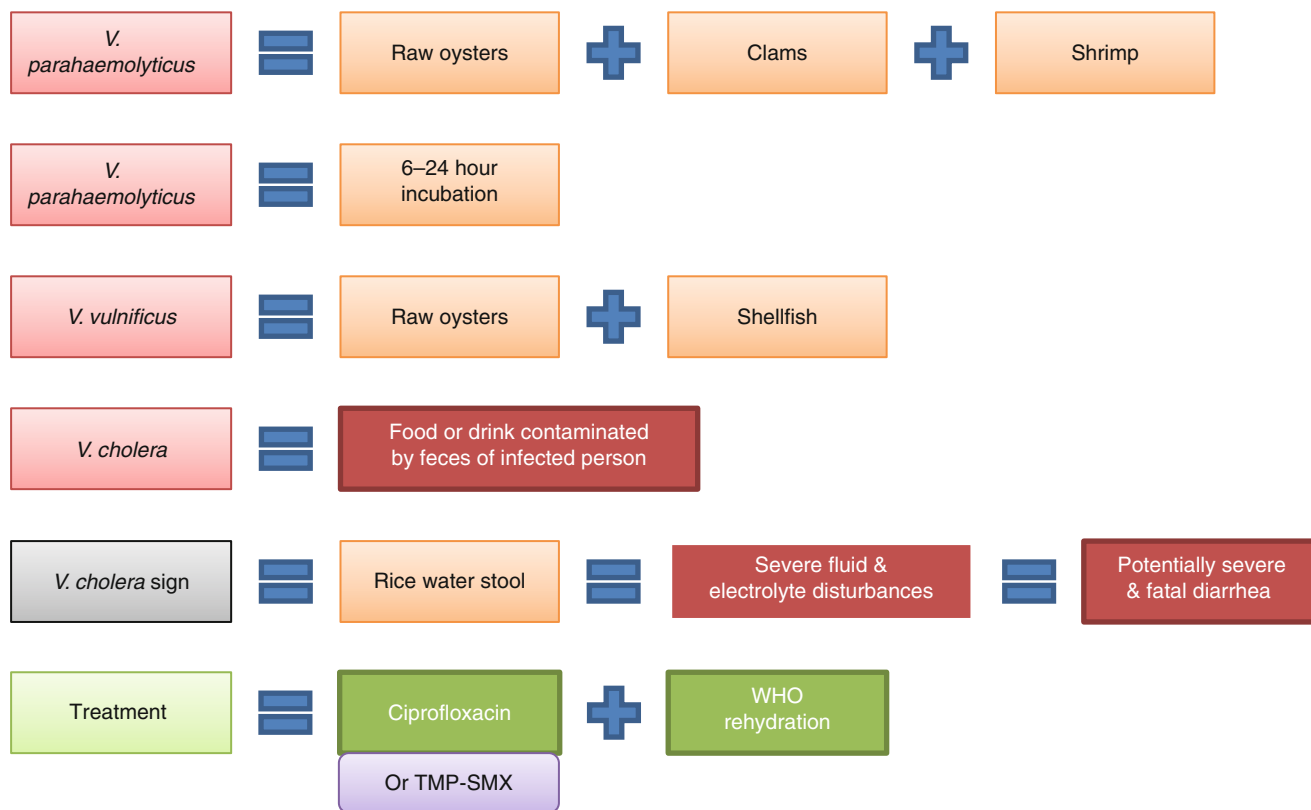
Specific Bacterial Pathogens: *Campylobacter*



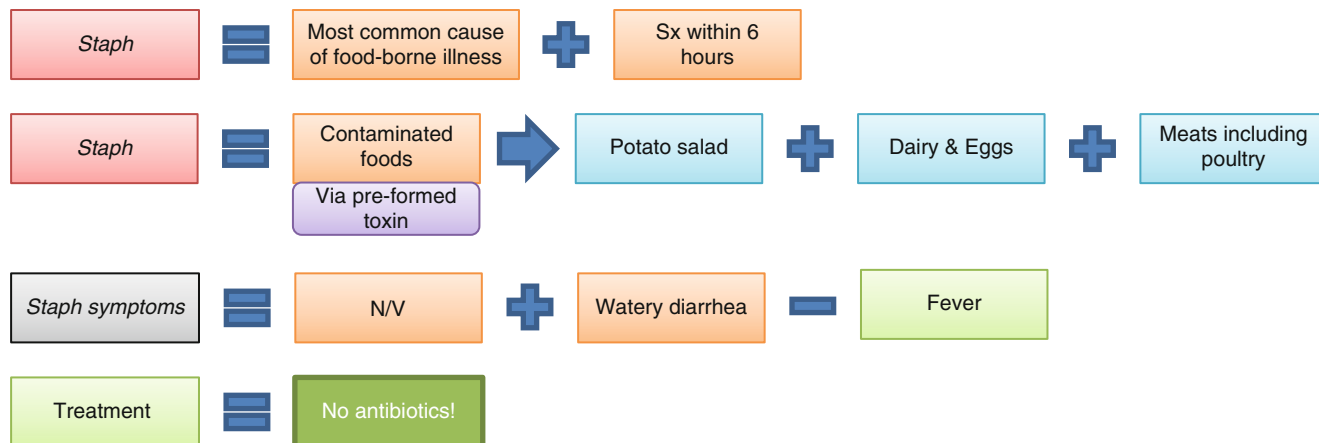
Specific Bacterial Pathogens: *Yersinia*



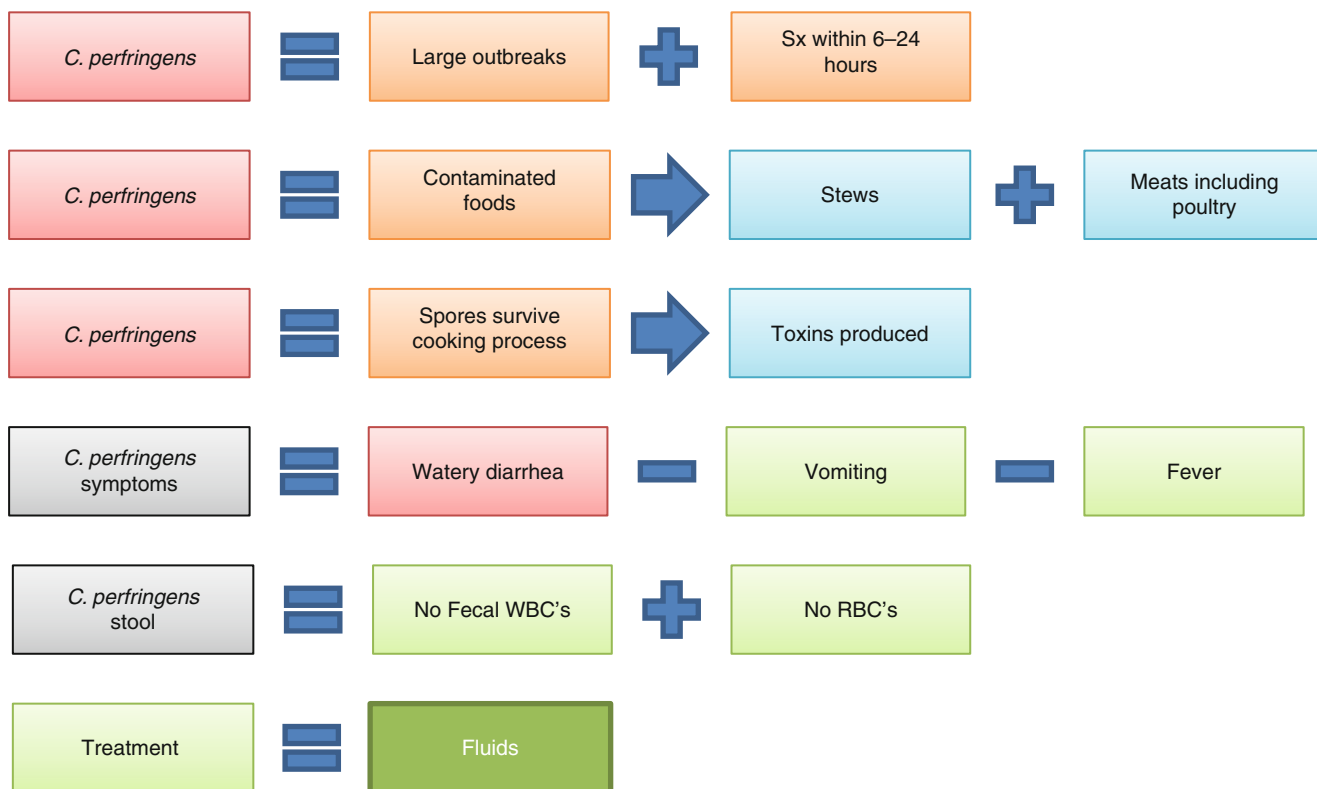
Specific Bacterial Pathogens: *Vibrio*



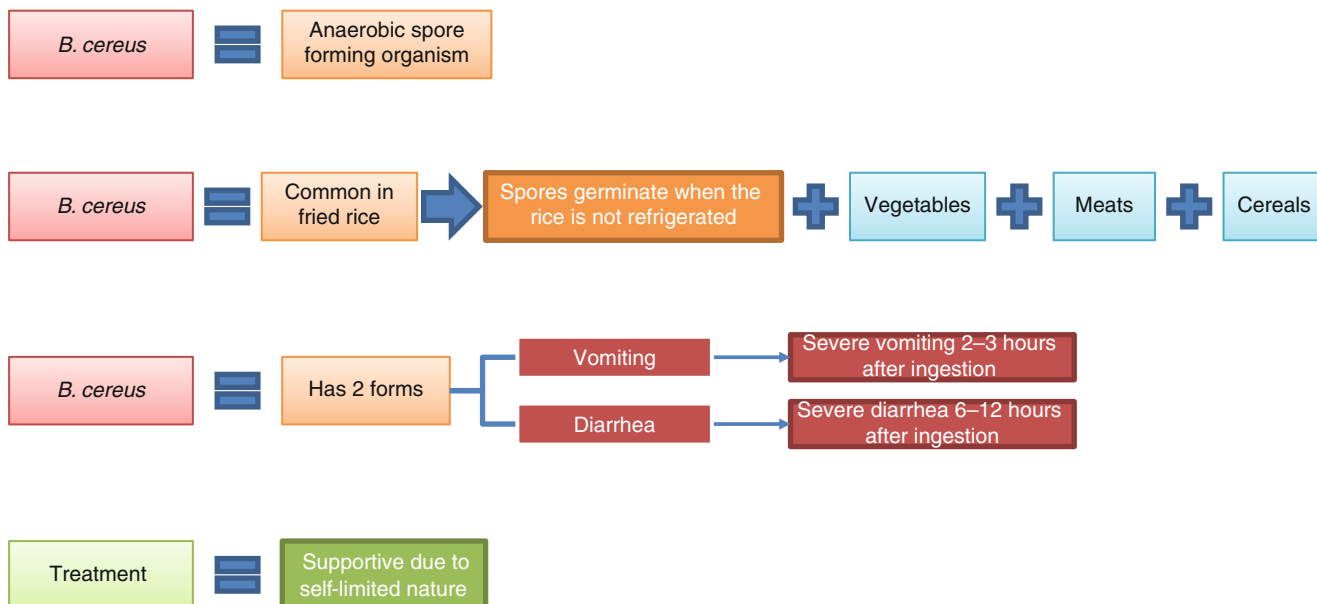
Specific Bacterial Pathogens: *Staphylococcus*



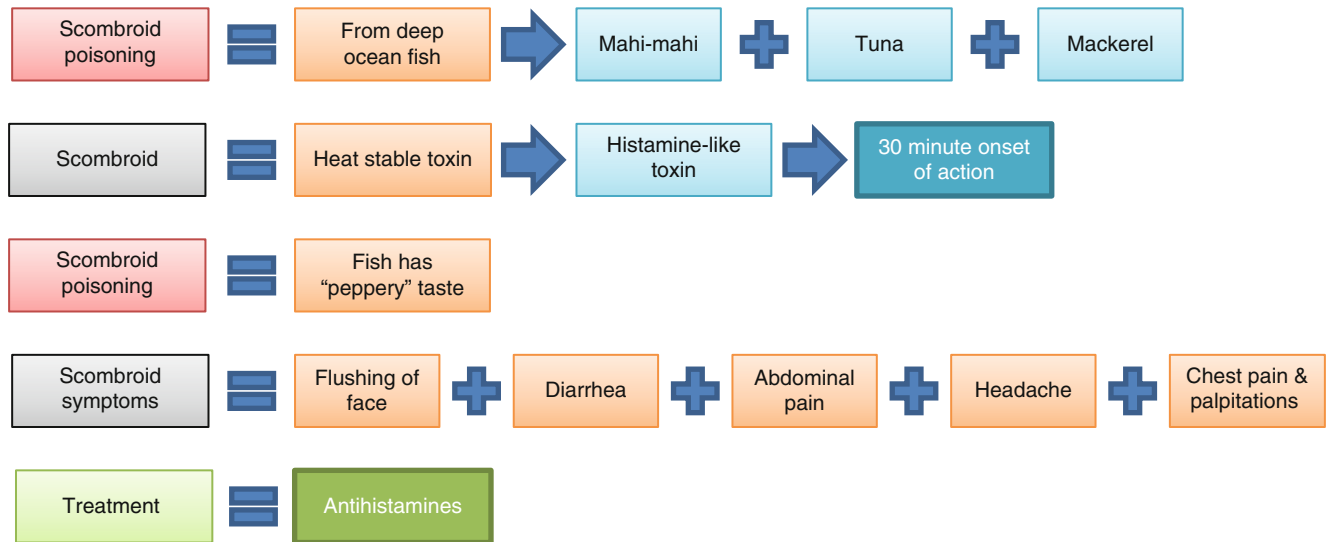
Specific Bacterial Pathogens: *Clostridium perfringens*



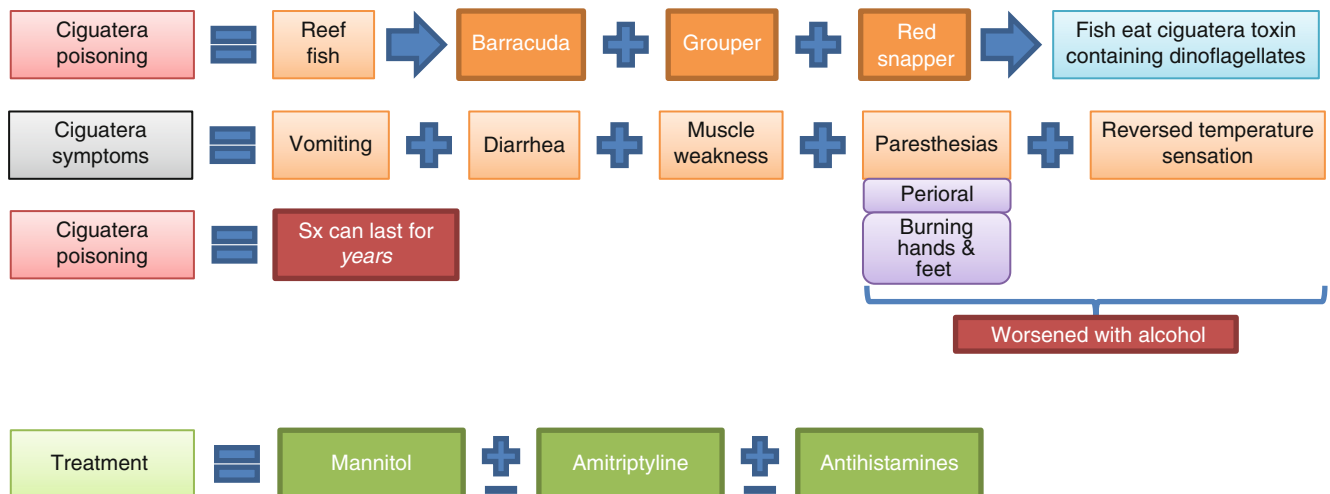
Specific Bacterial Pathogens: *Bacillus cereus*



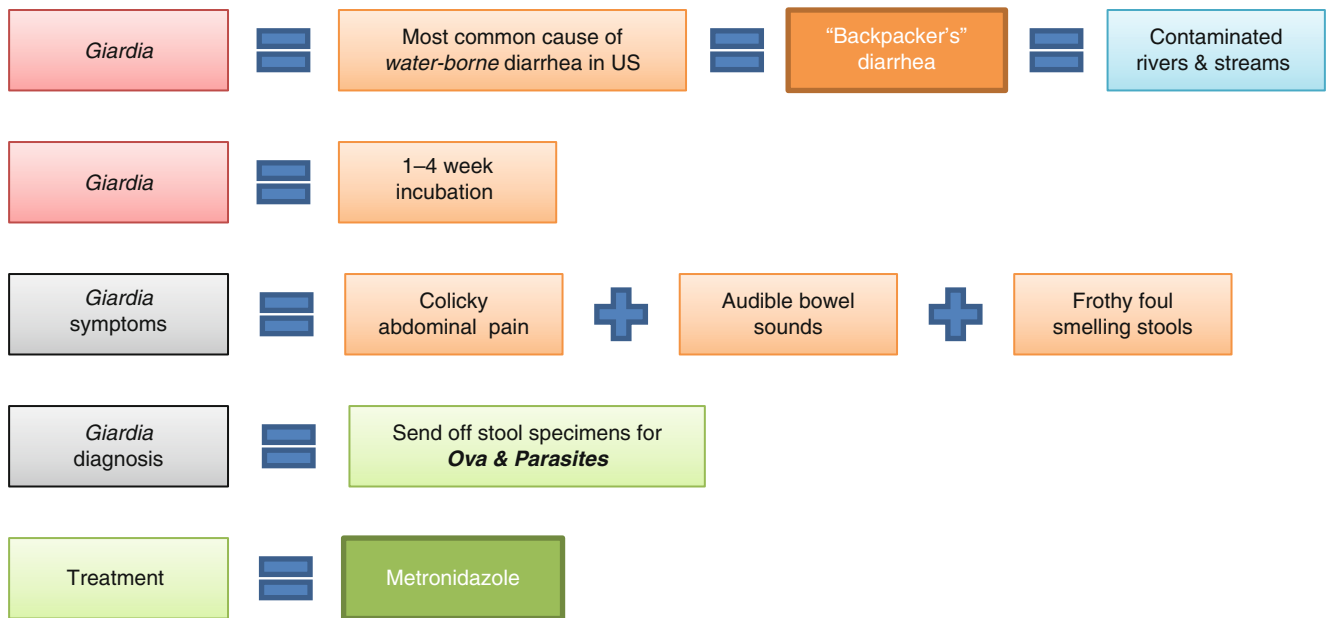
Specific Toxins: Scombroid



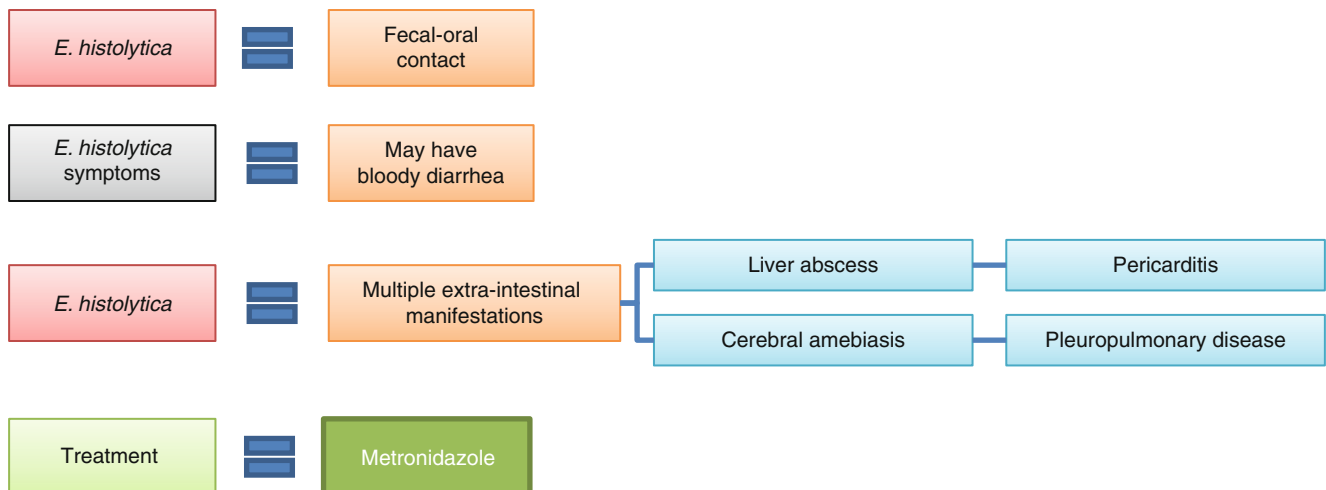
Specific Toxins: Ciguatera

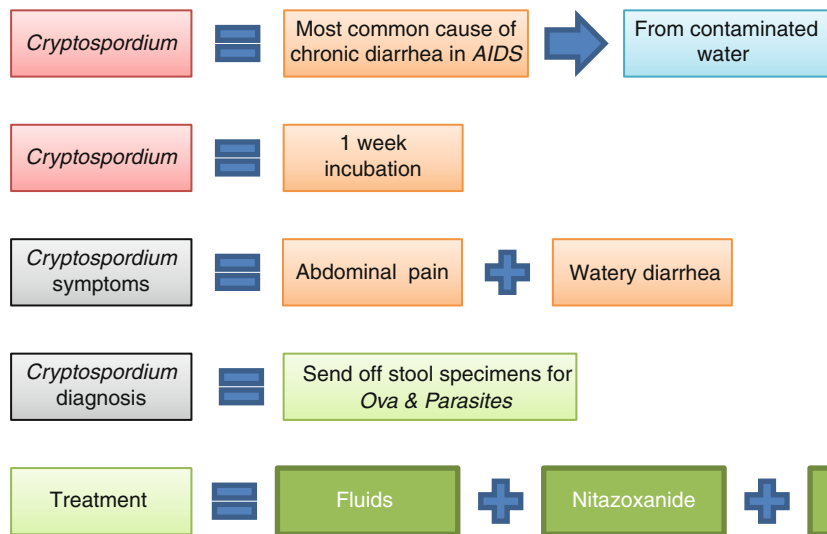
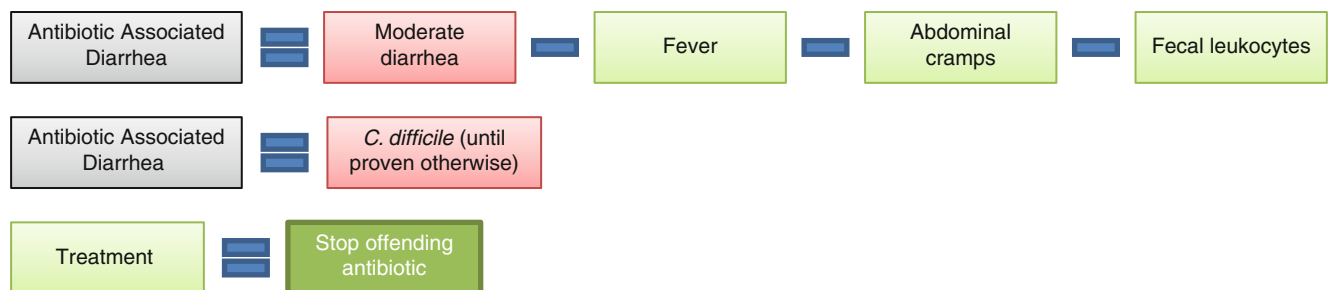


Specific Protozoan Pathogens: *Giardia*

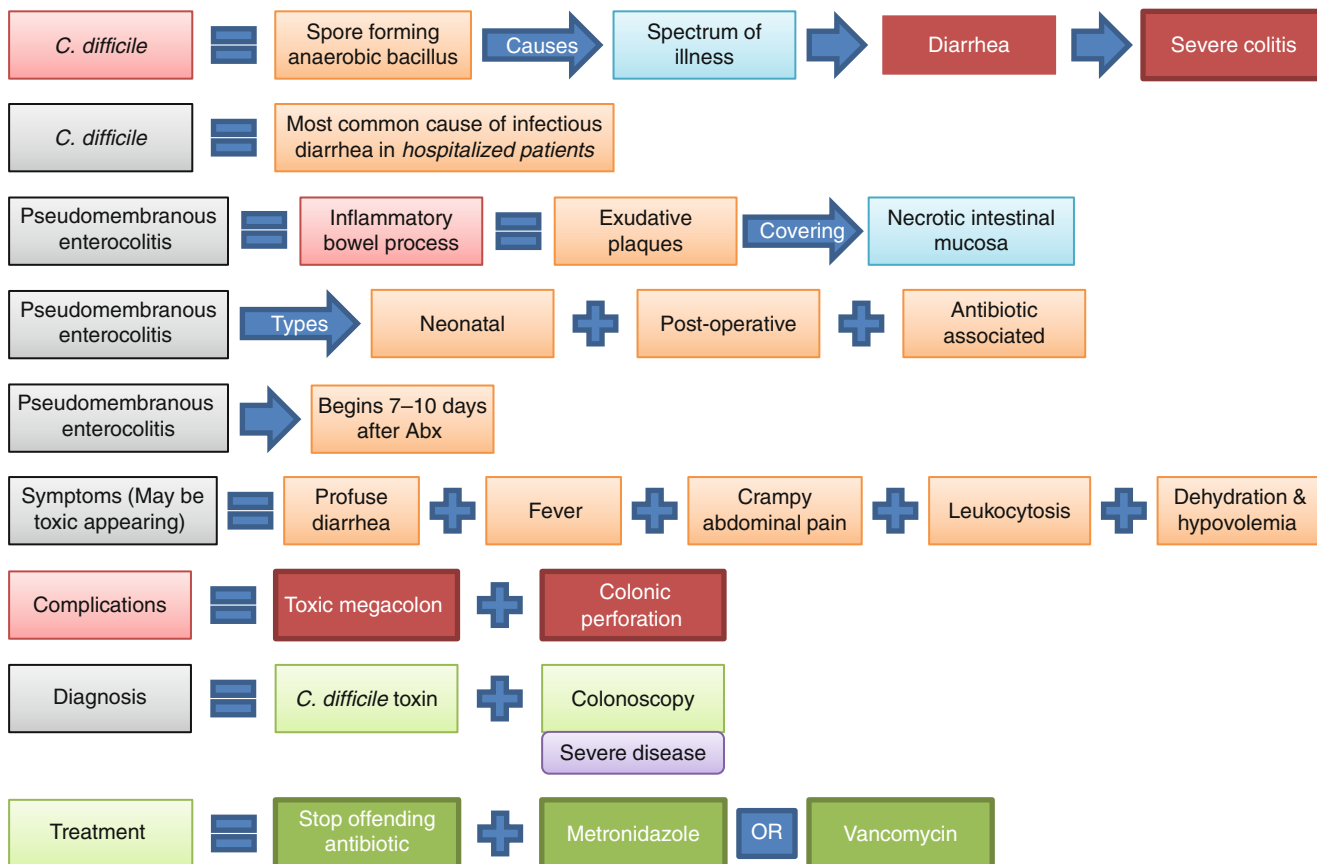


Specific Protozoan Pathogens: *Entamoeba histolytica*



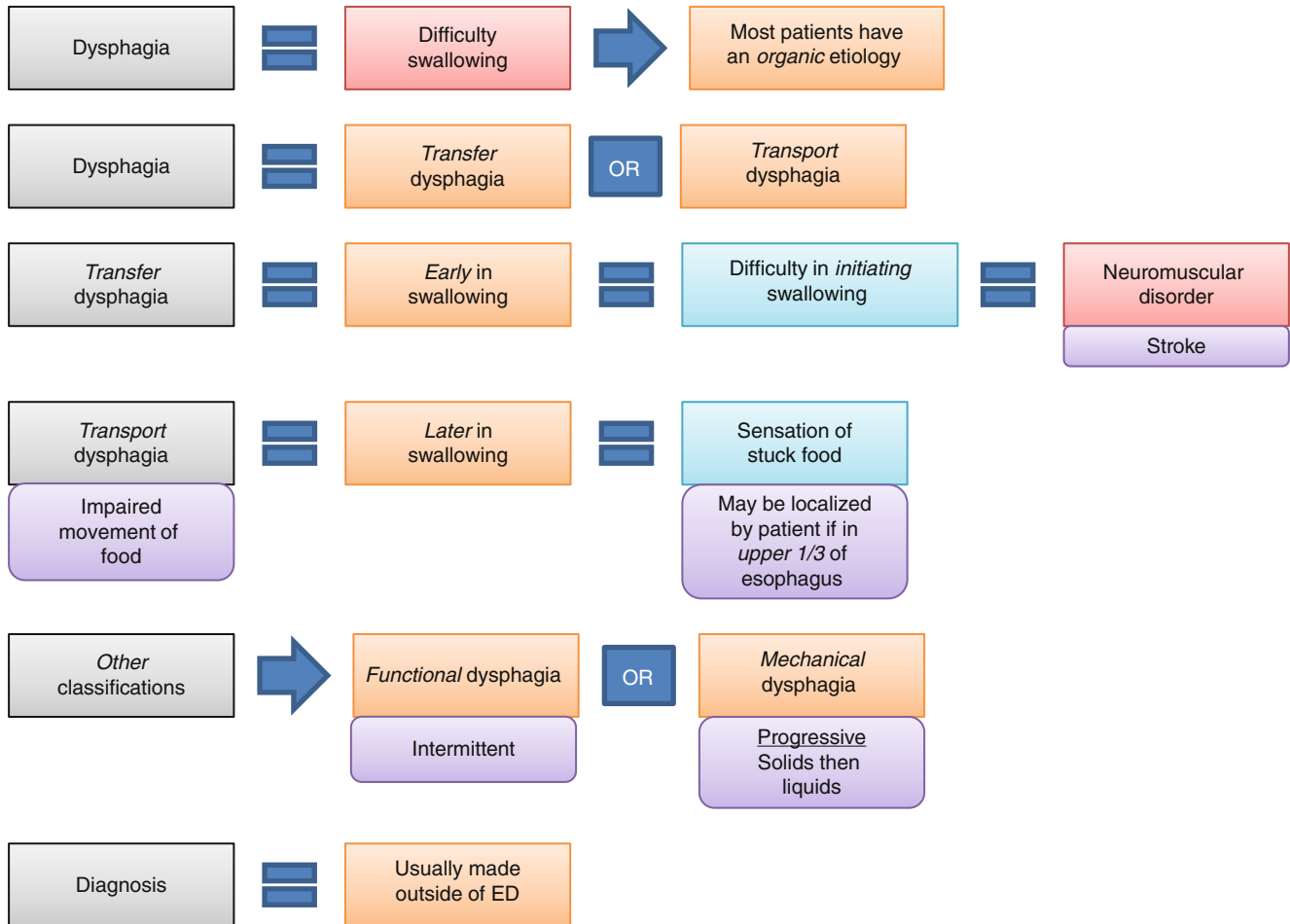
Specific Protozoan Pathogens: *Cryptosporidium***Antibiotic-Associated Diarrhea**

***Clostridium difficile* and Pseudomembranous Enterocolitis**

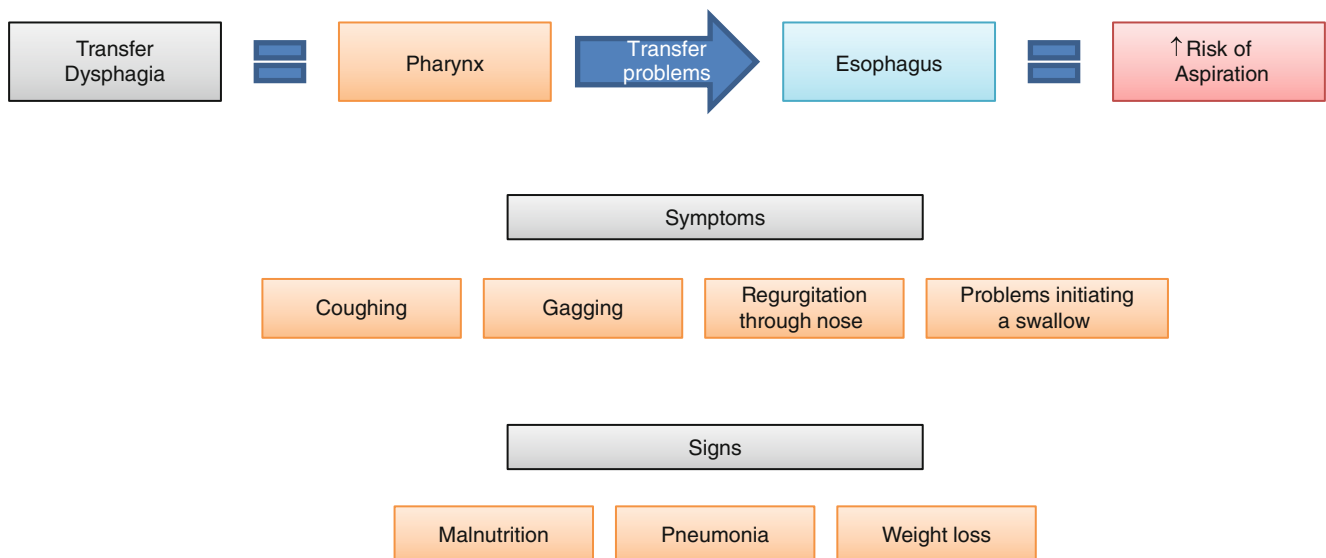


Esophageal Emergencies

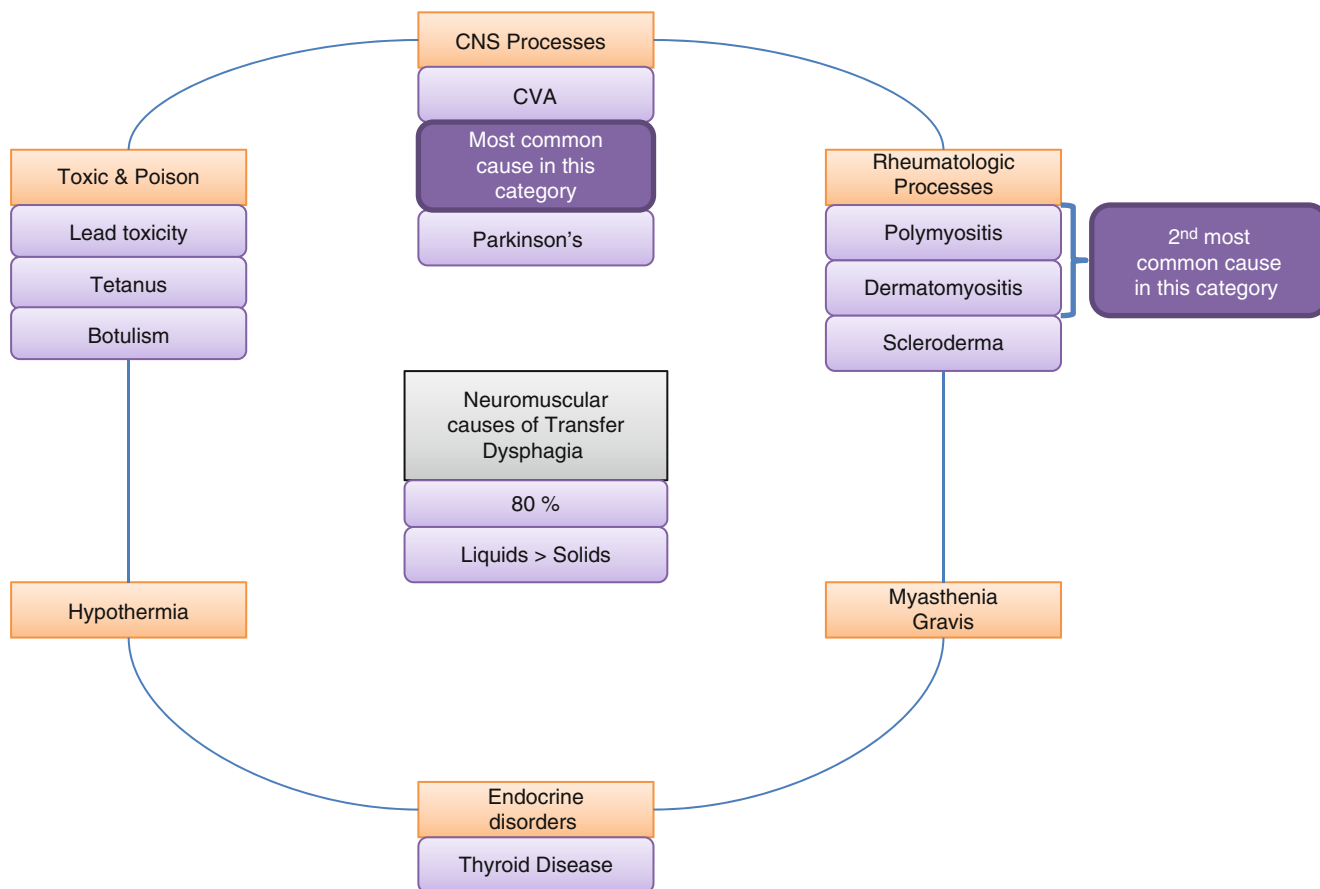
Dysphagia

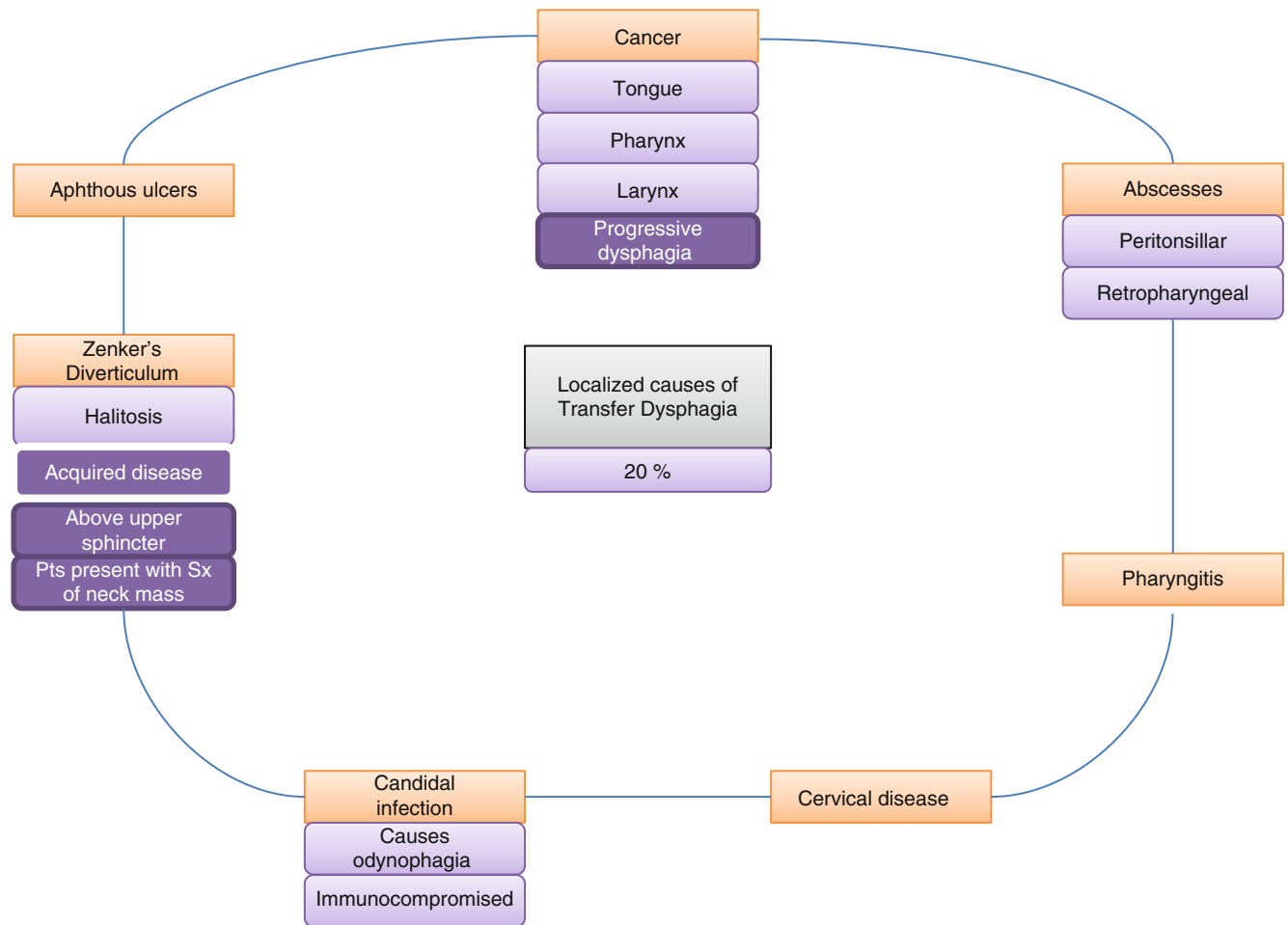


Transfer Dysphagia

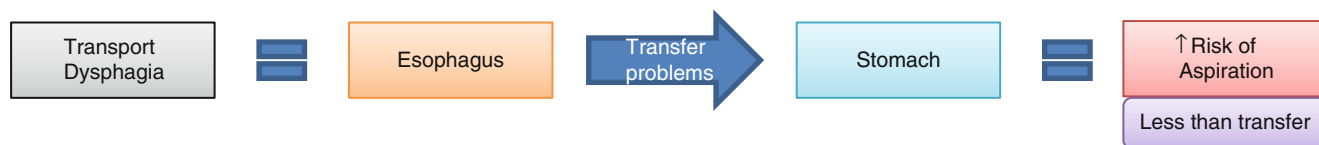


Neuromuscular Causes of Transfer Dysphagia

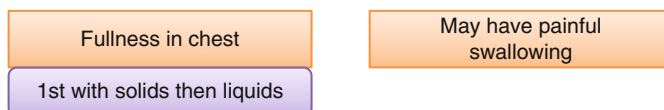


Localized Causes of Transfer Dysphagia

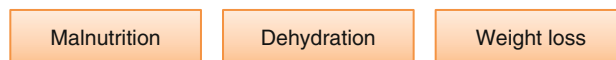
Transport Dysphagia



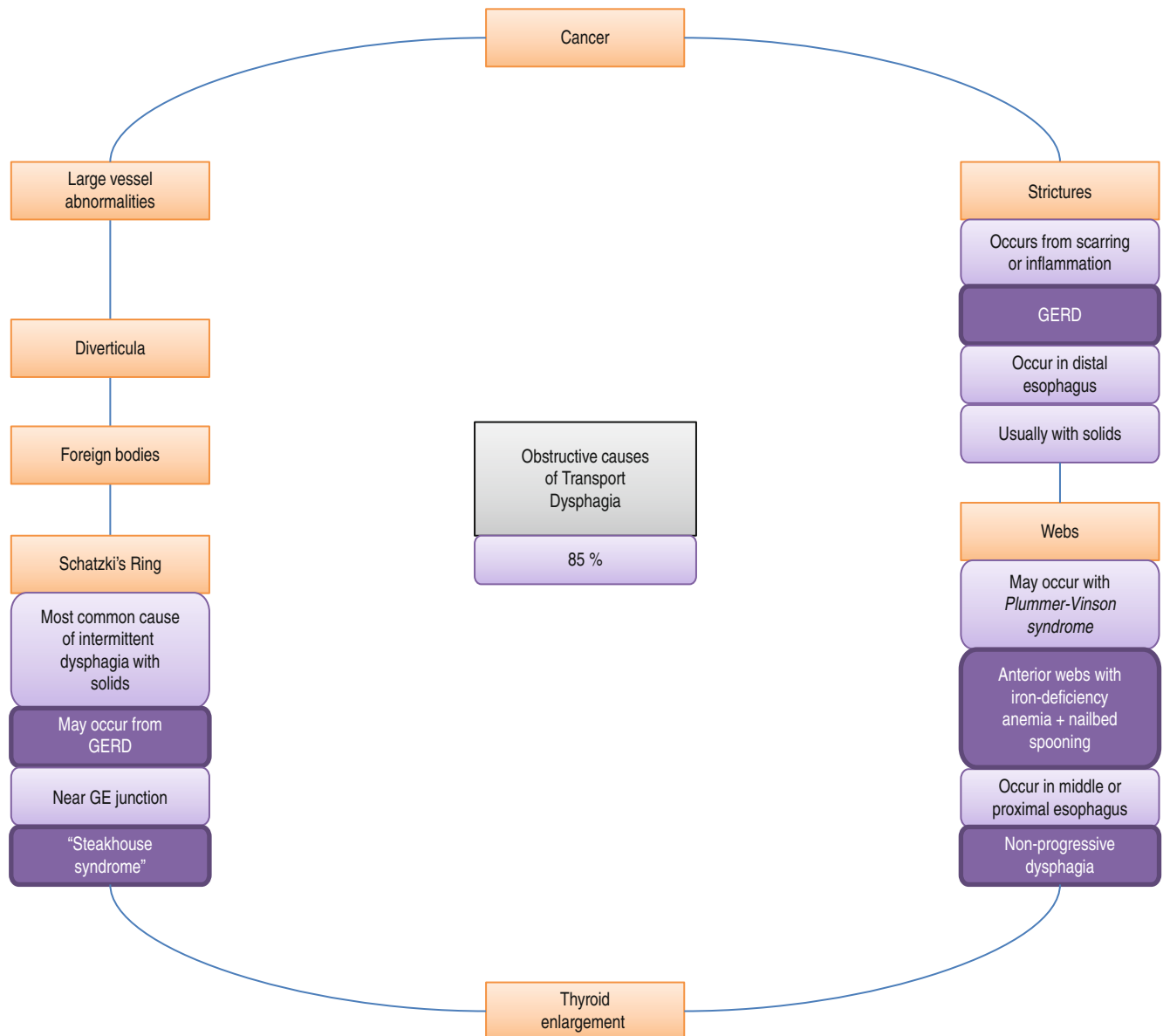
Symptoms



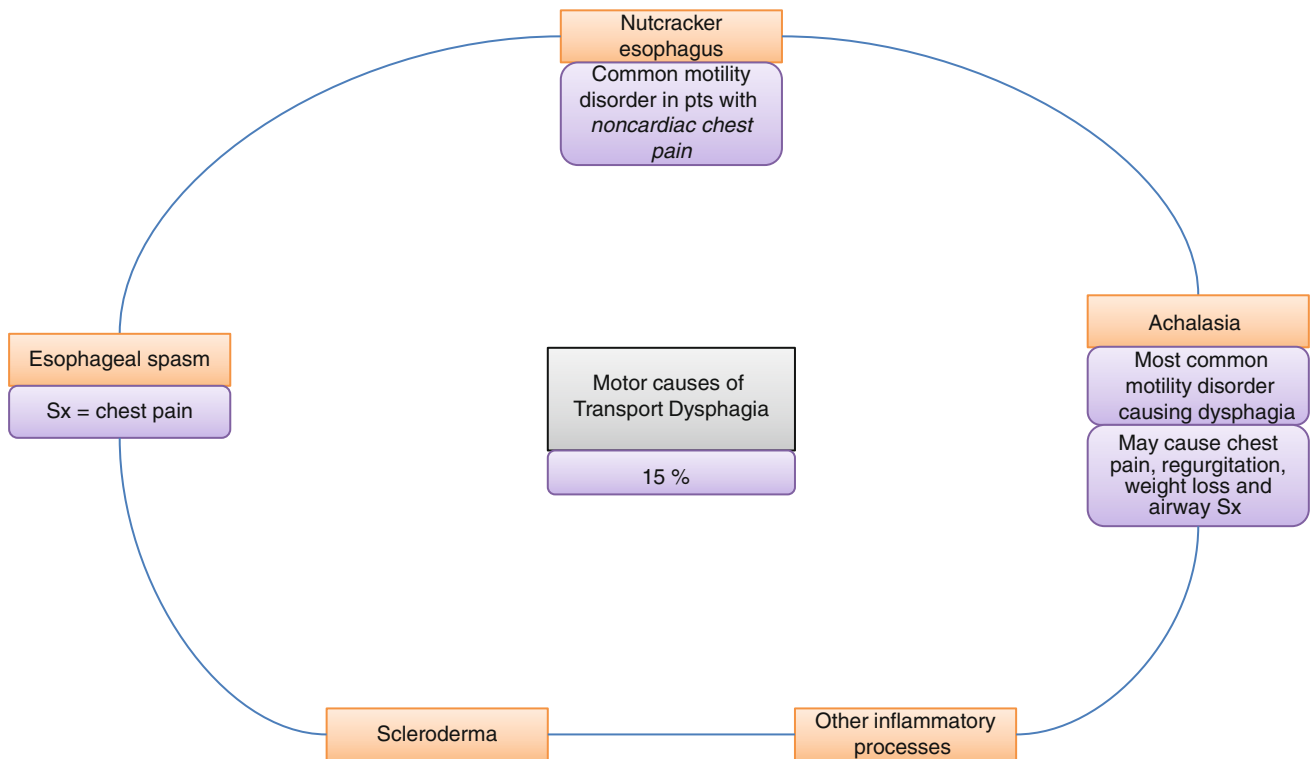
Signs



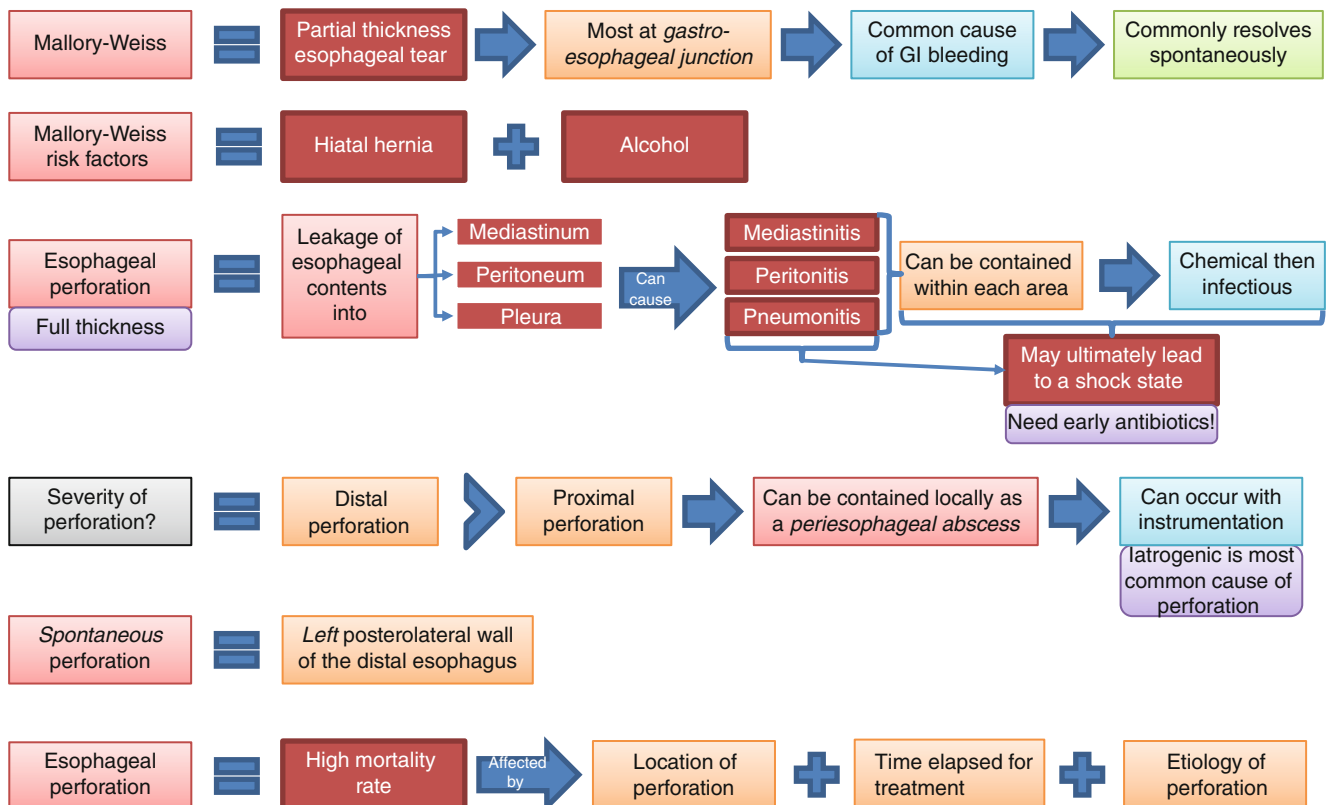
Obstructive Causes of Transport Dysphagia



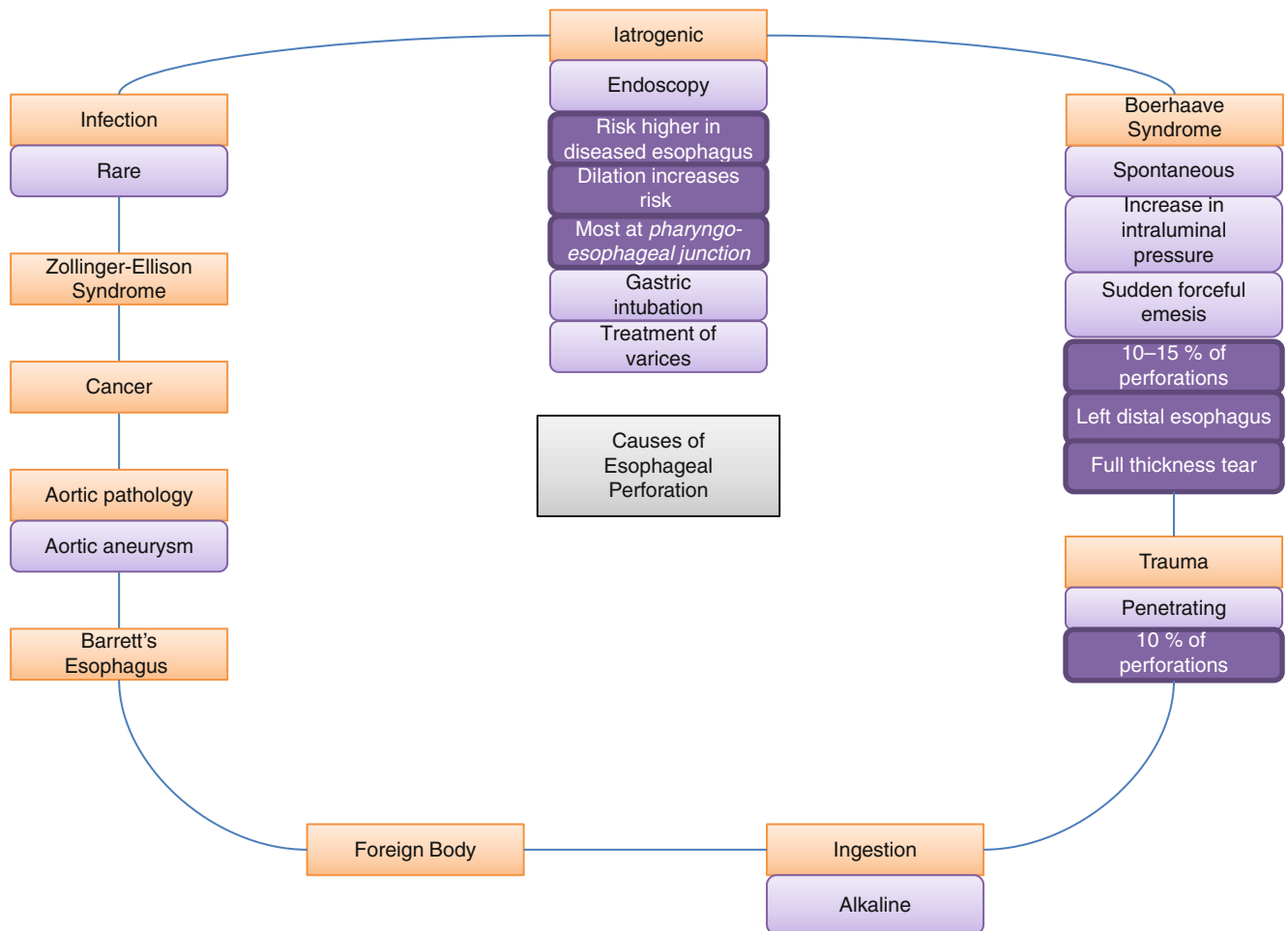
Motor Causes of Transport Dysphagia



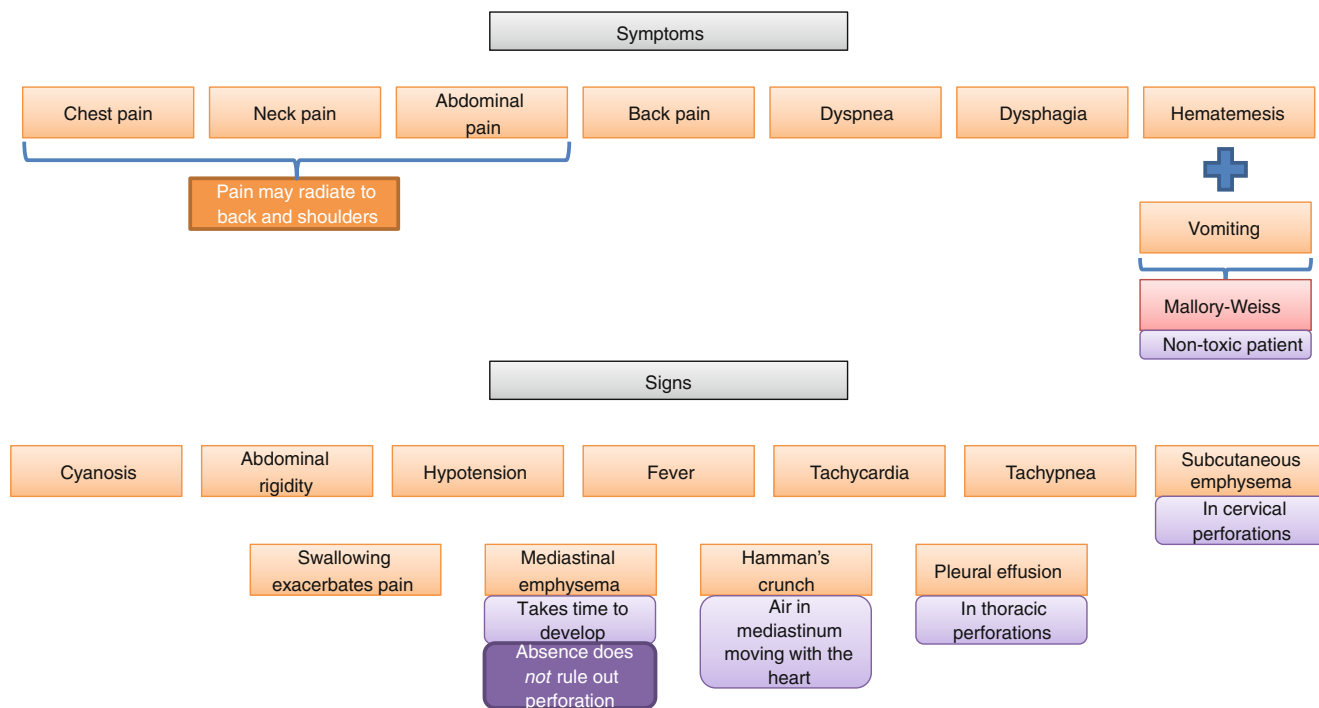
Esophageal Perforation



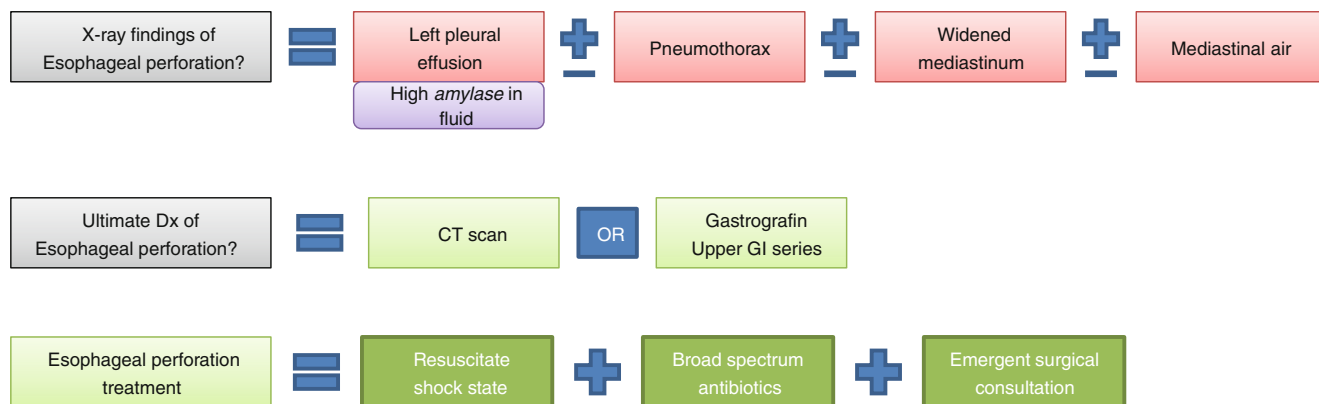
Causes of Esophageal Perforation



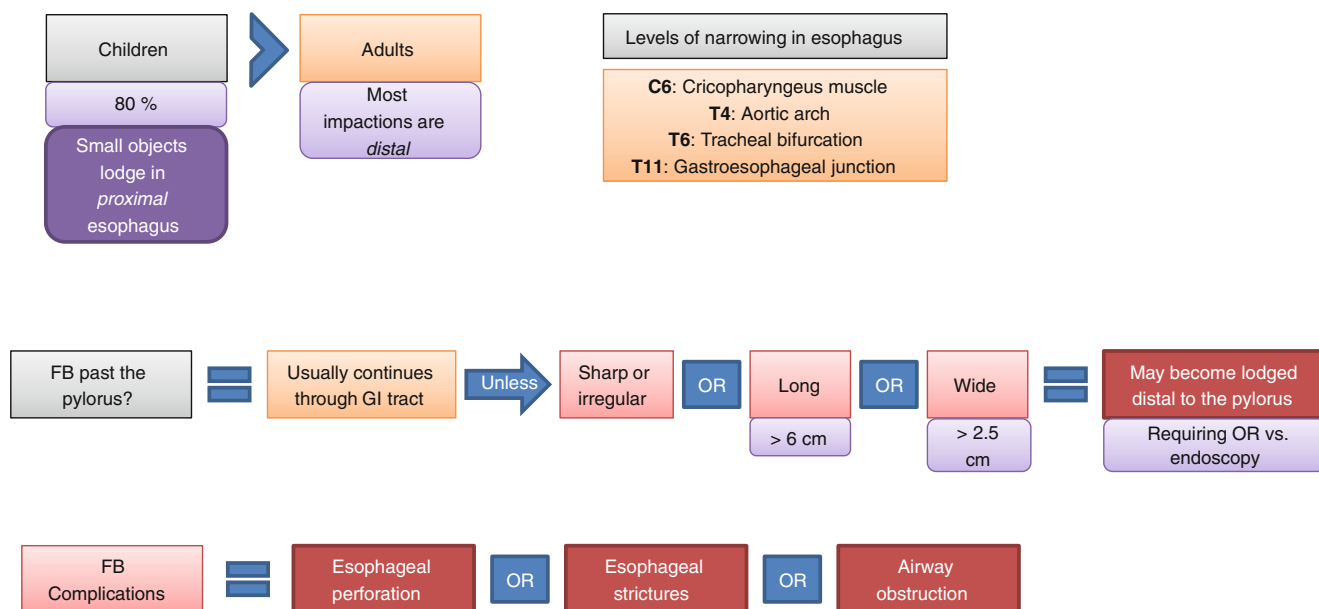
Esophageal Perforation Symptoms and Signs



Diagnosis and Treatment

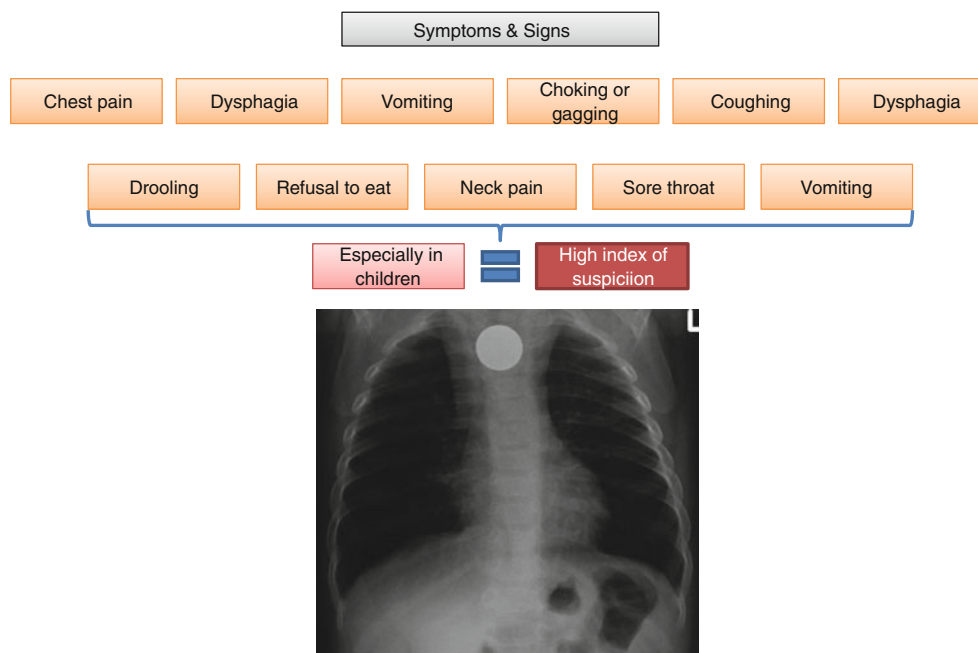


Esophageal Foreign Bodies

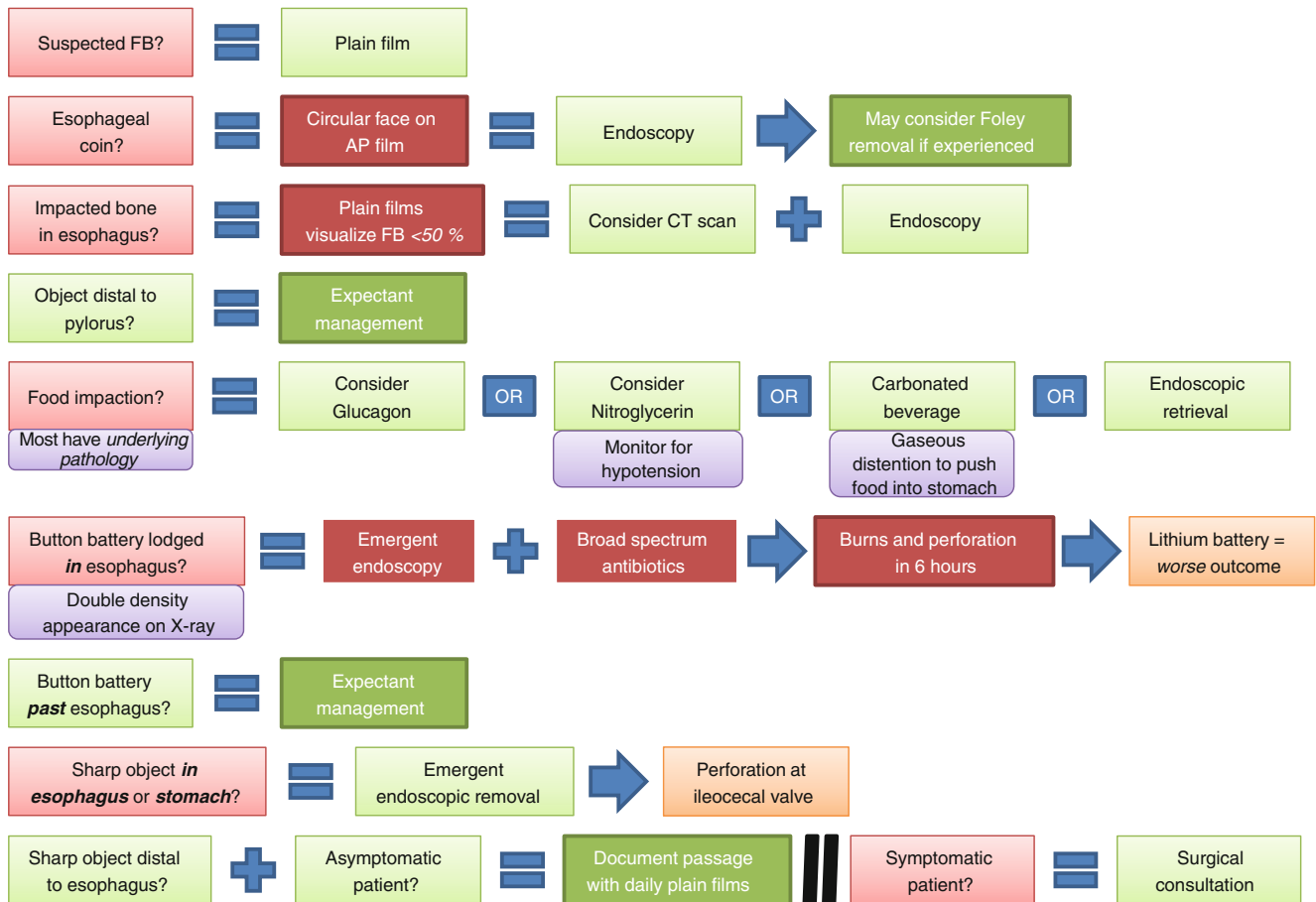


Esophageal Foreign Body Symptoms and Signs

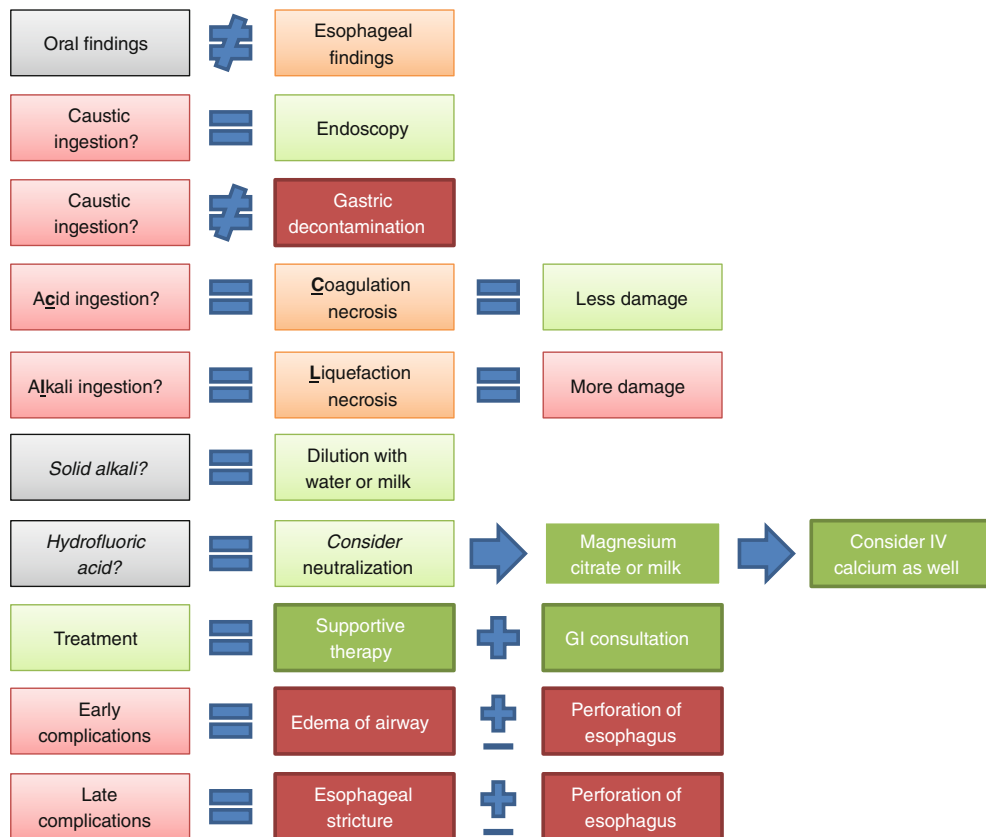
Center bottom image (Reprinted without modification from James Heilman <https://commons.wikimedia.org/wiki/File:CoinAP.jpg>. With permission from the Creative Commons License <https://creativecommons.org/licenses/by-sa/3.0/deed.en>)



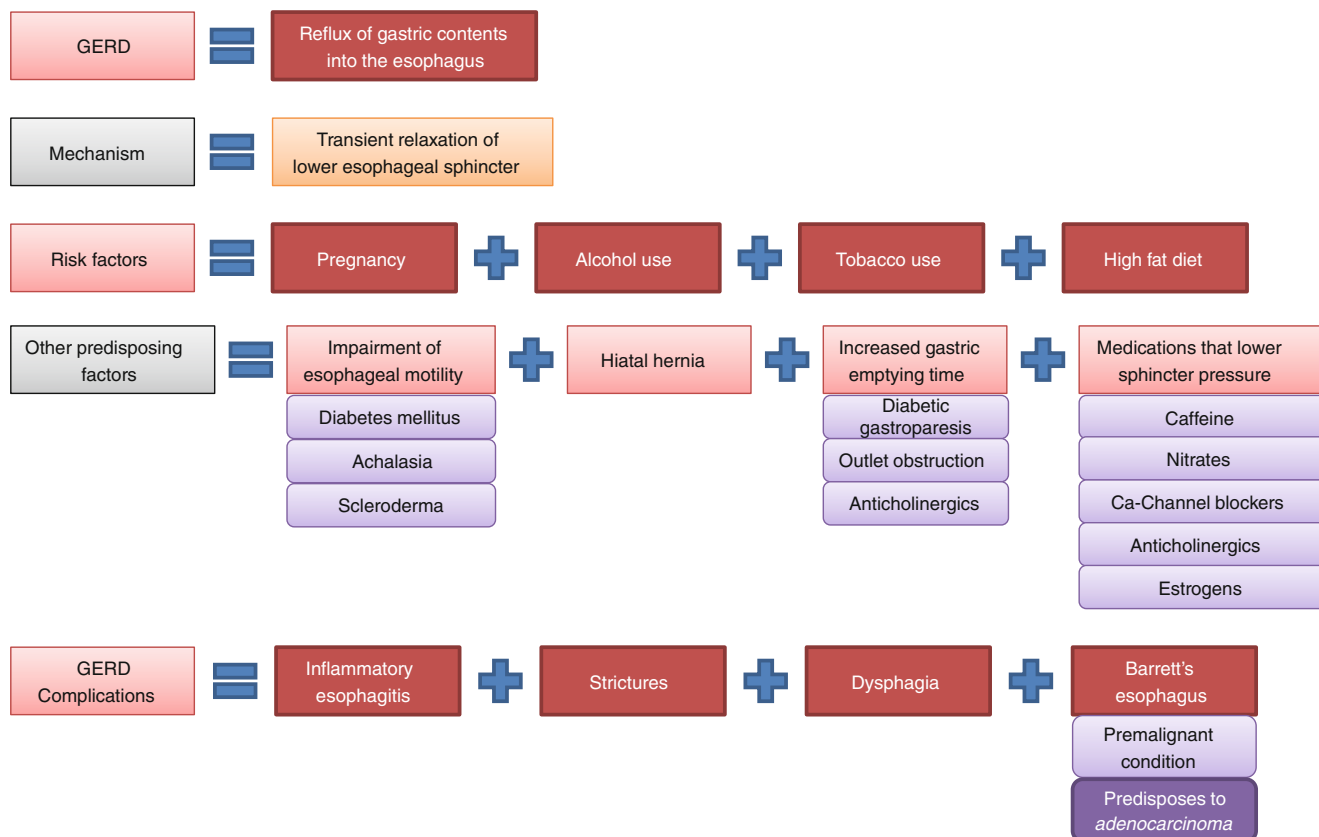
Diagnosis and Treatment of Esophageal Foreign Bodies



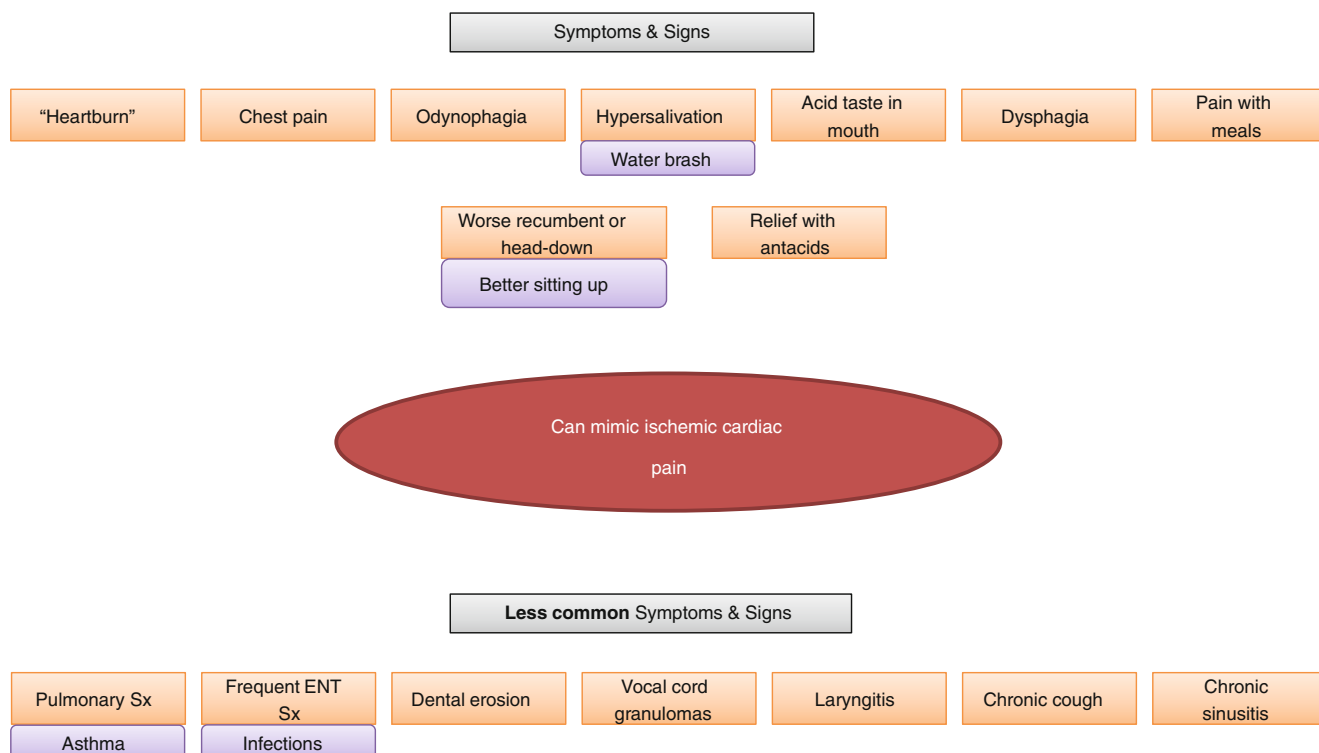
Caustic Ingestions



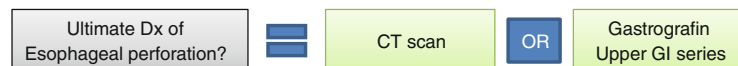
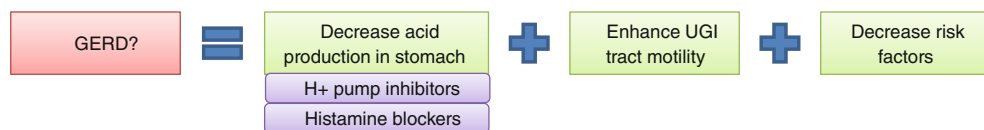
GERD



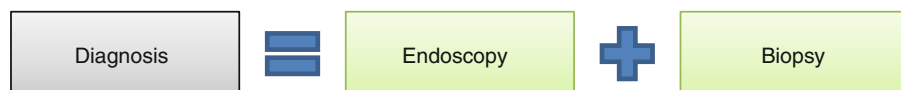
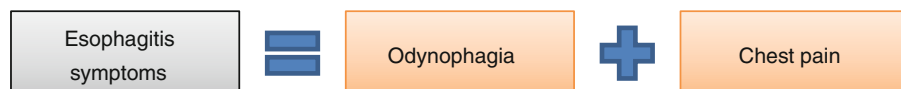
GERD Symptoms and Signs



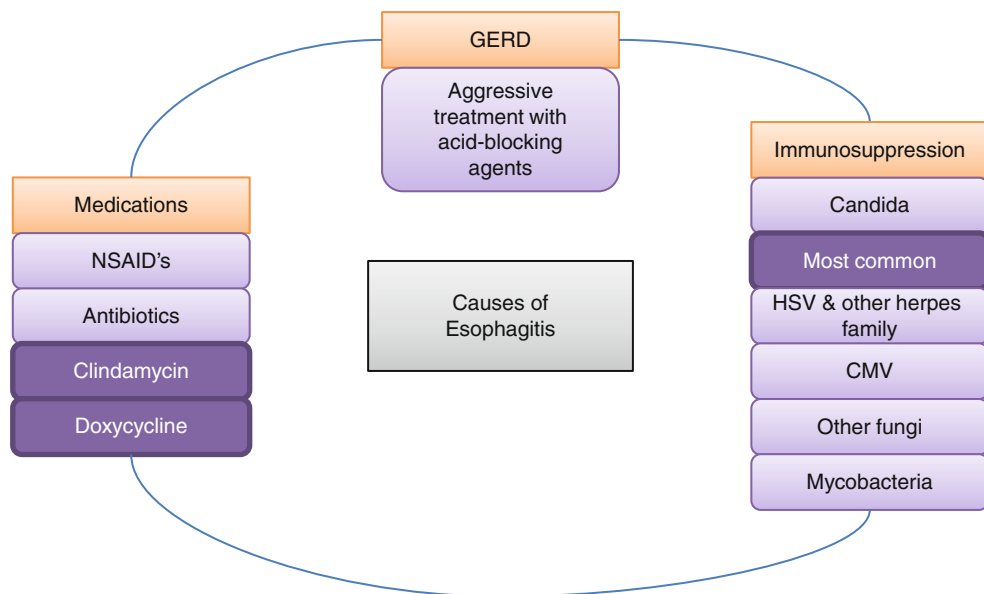
GERD Treatment



Esophagitis

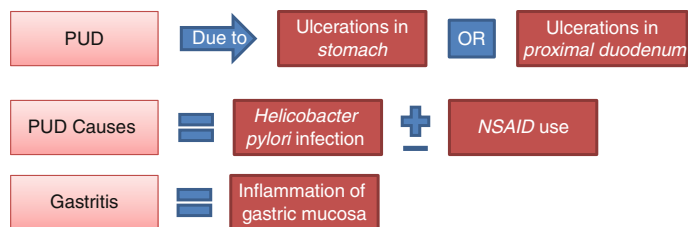


Causes of Esophagitis

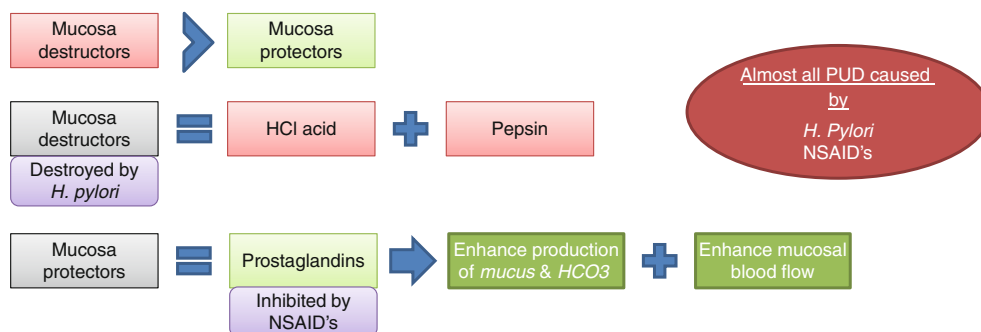


Peptic Ulcer Disease

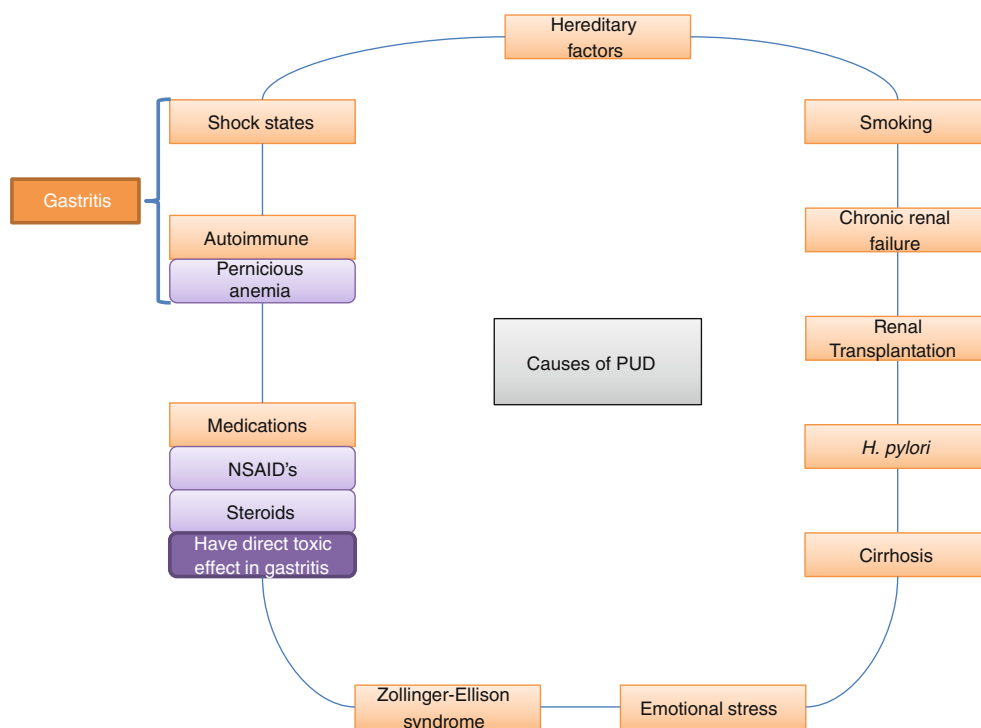
Introduction



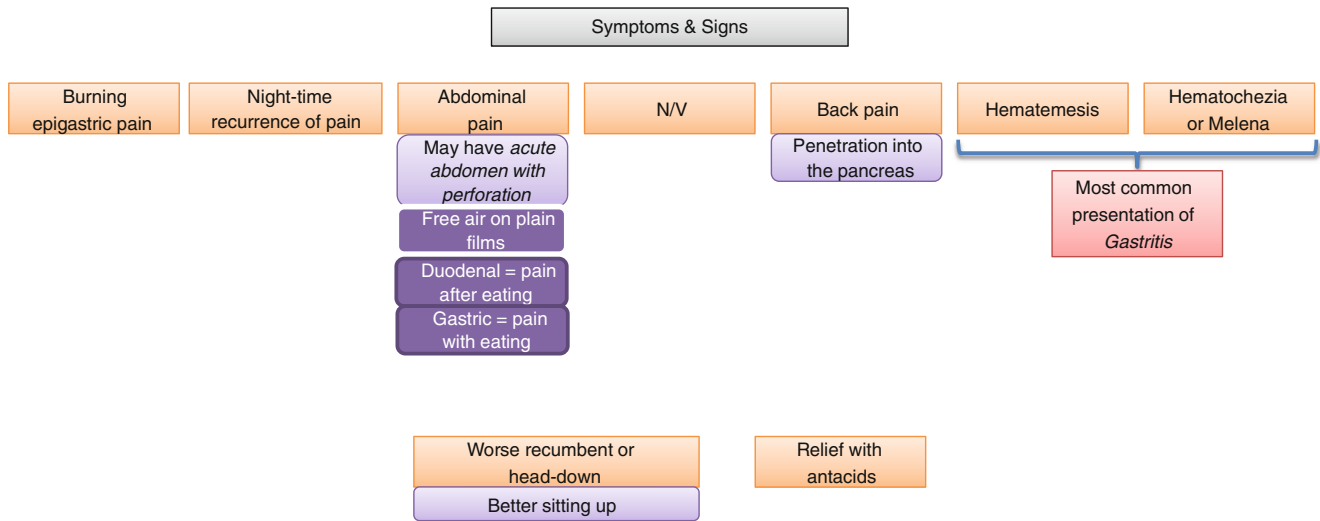
Pathophysiology



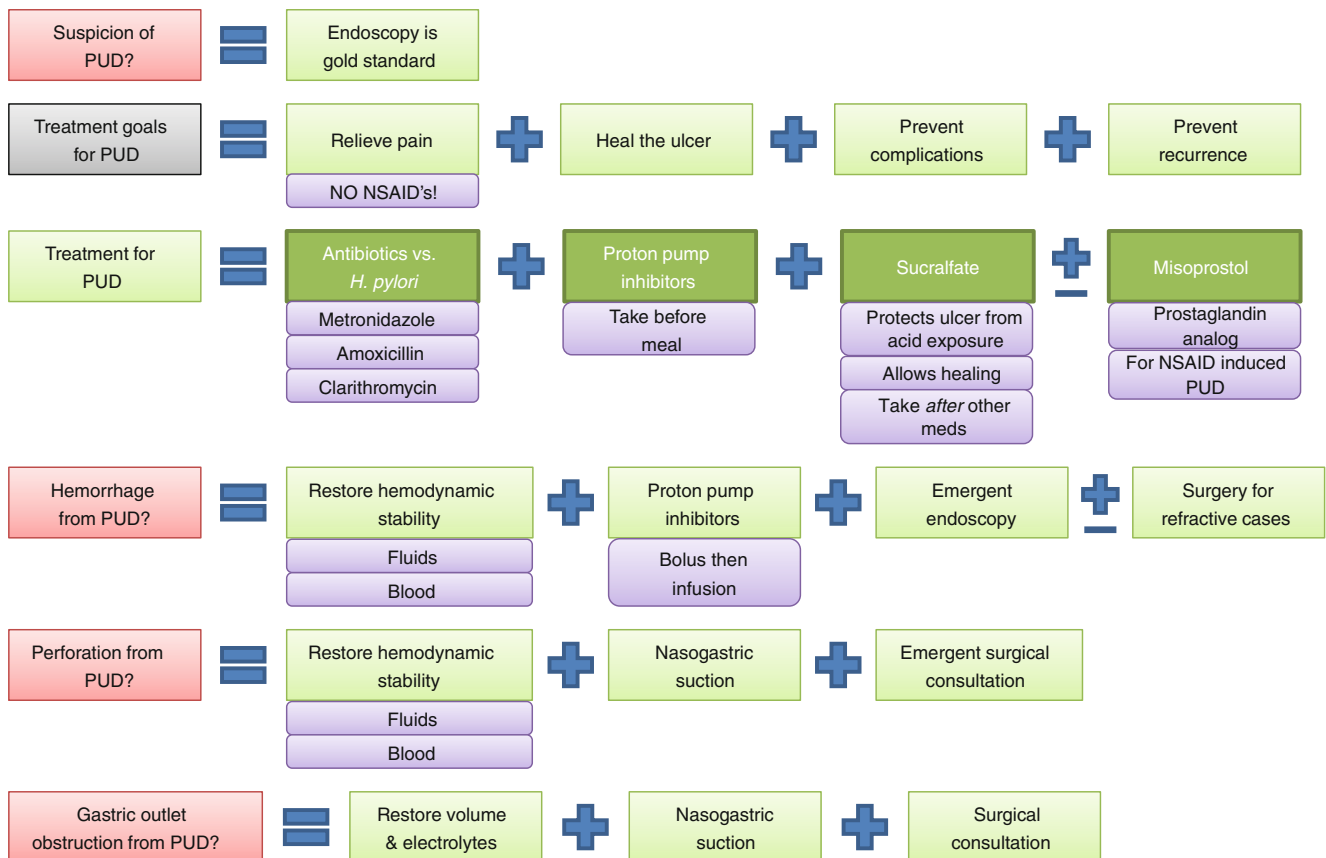
Causes of PUD and Gastritis



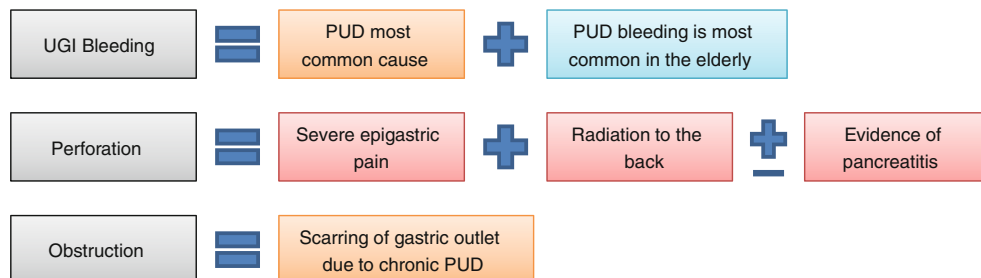
PUD Symptoms and Signs



PUD Diagnosis and Treatment

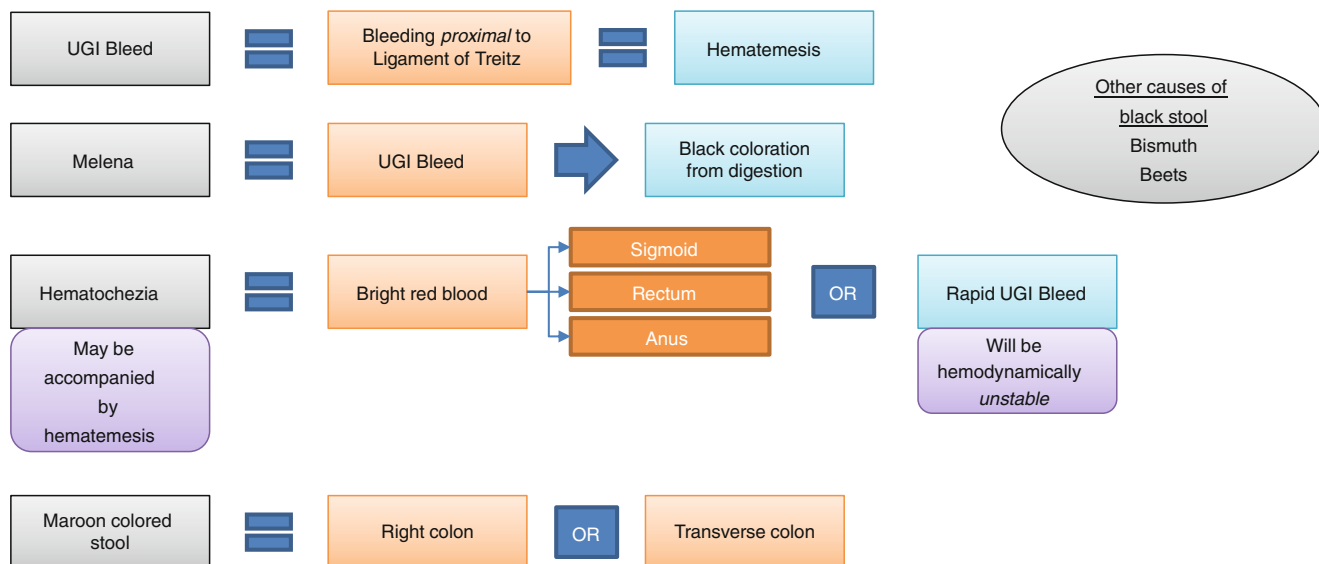


PUD Complications

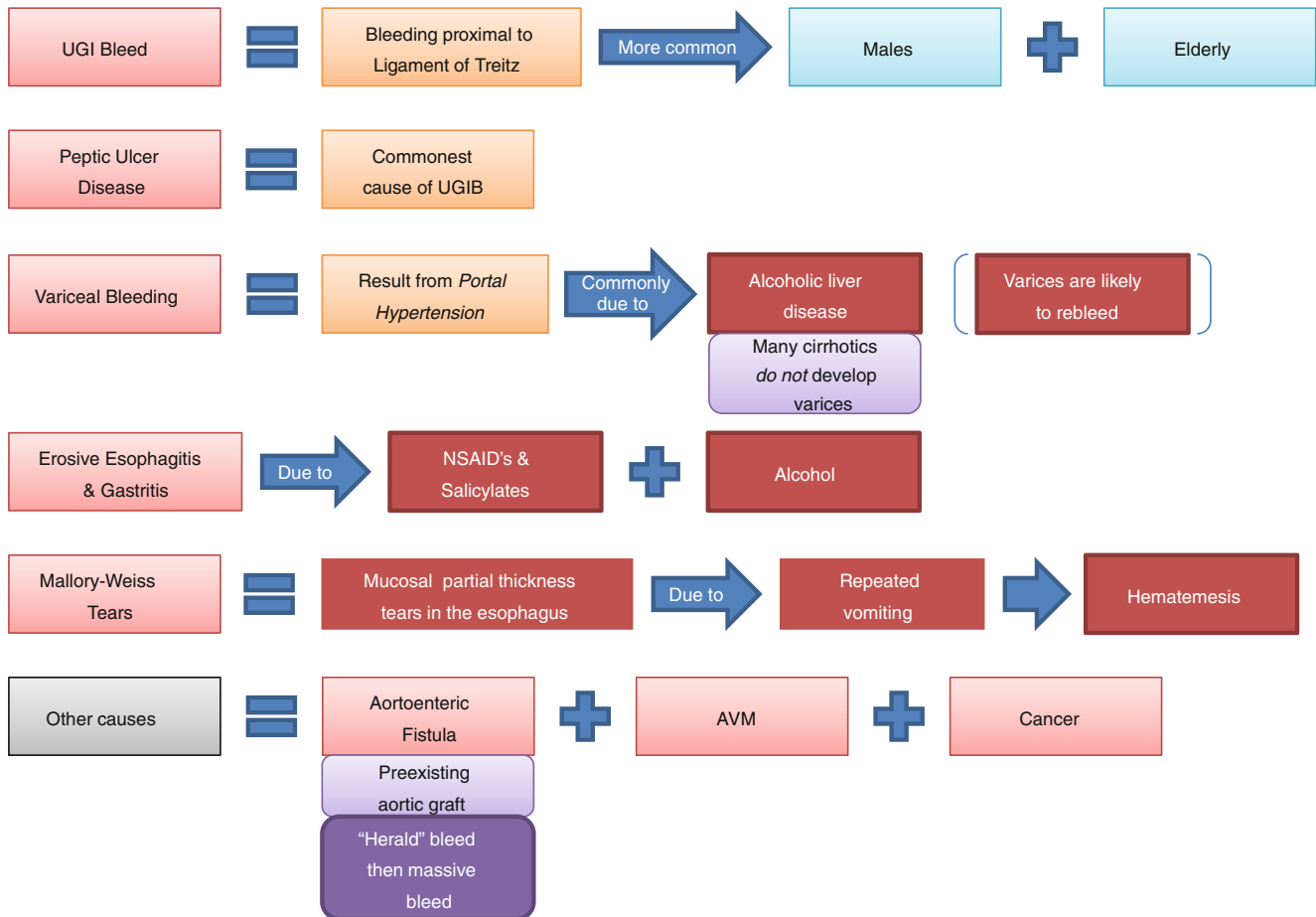


GI Bleeding

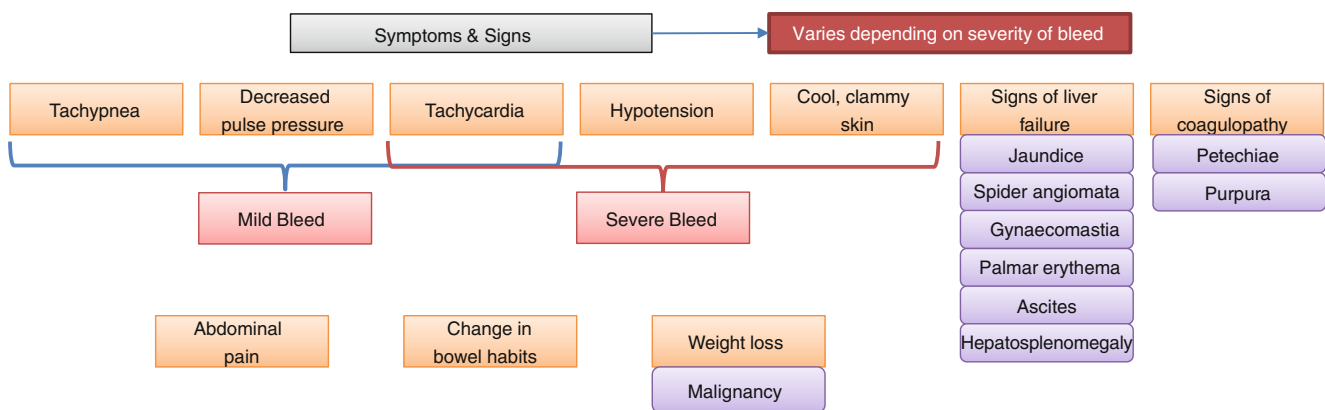
Terminology



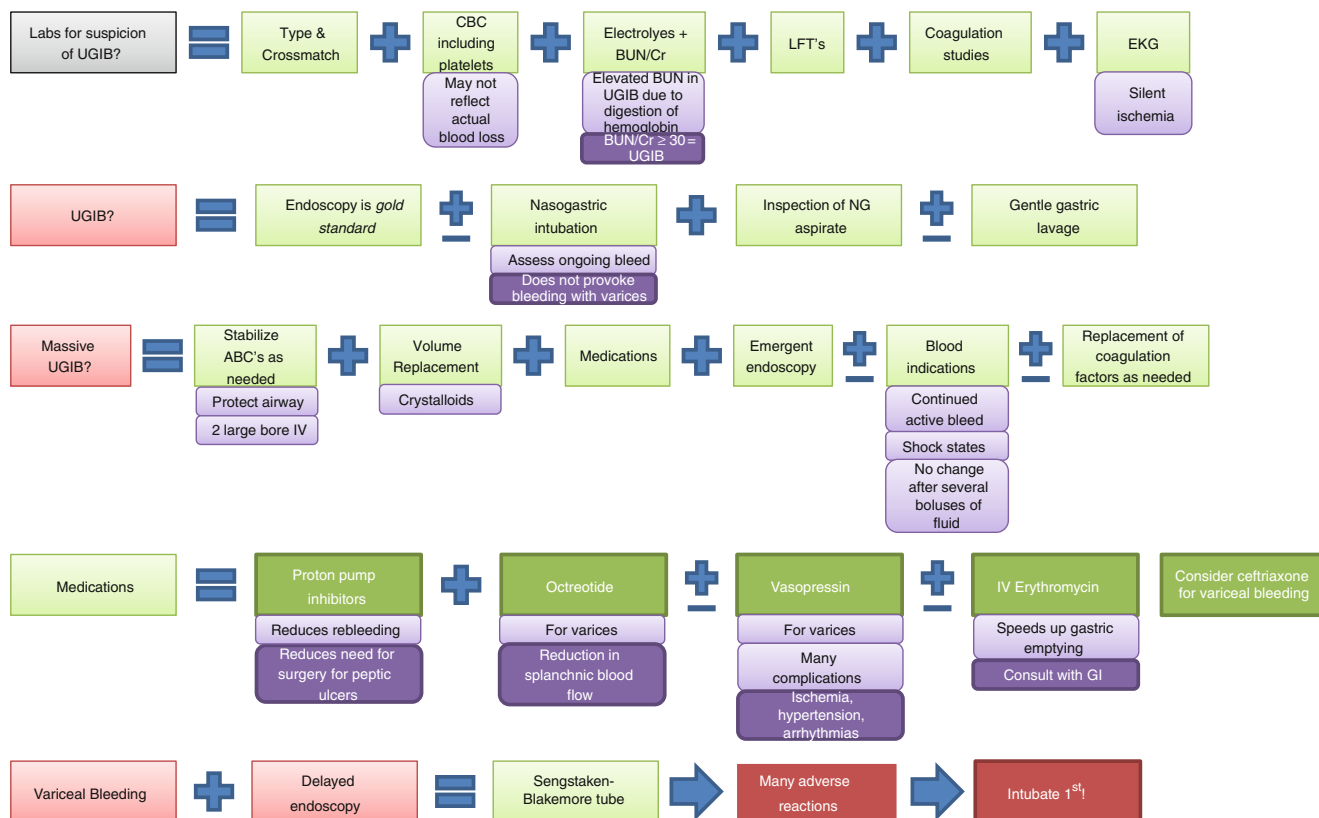
Introduction: Upper GI Bleeding (UGIB)



UGIB Symptoms and Signs

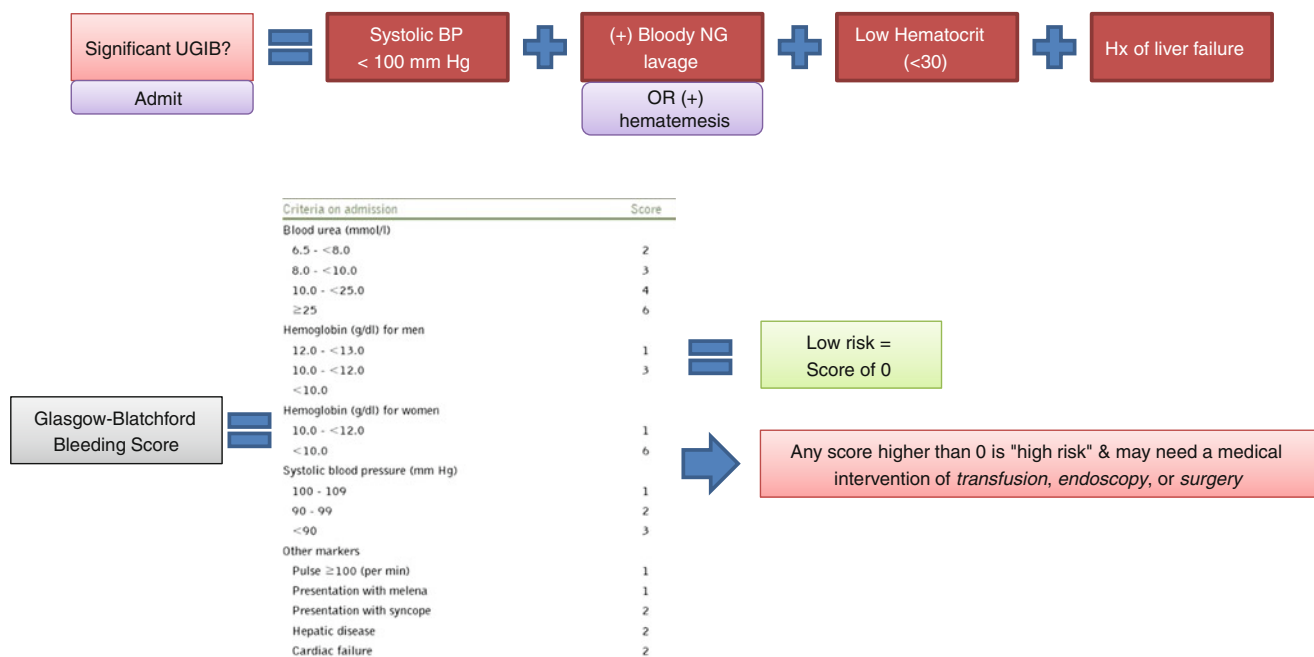


UGIB Diagnosis and Treatment

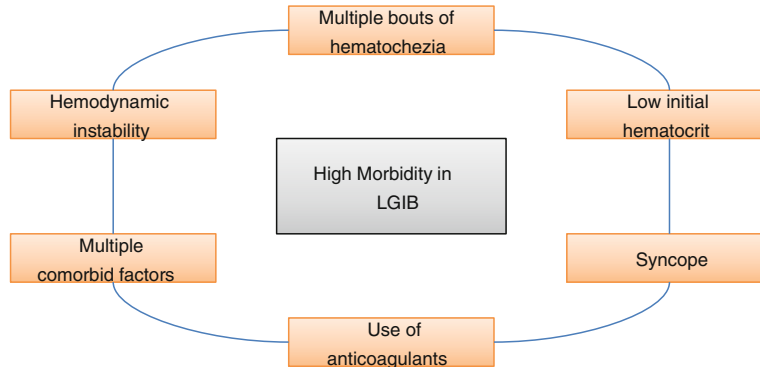


Disposition

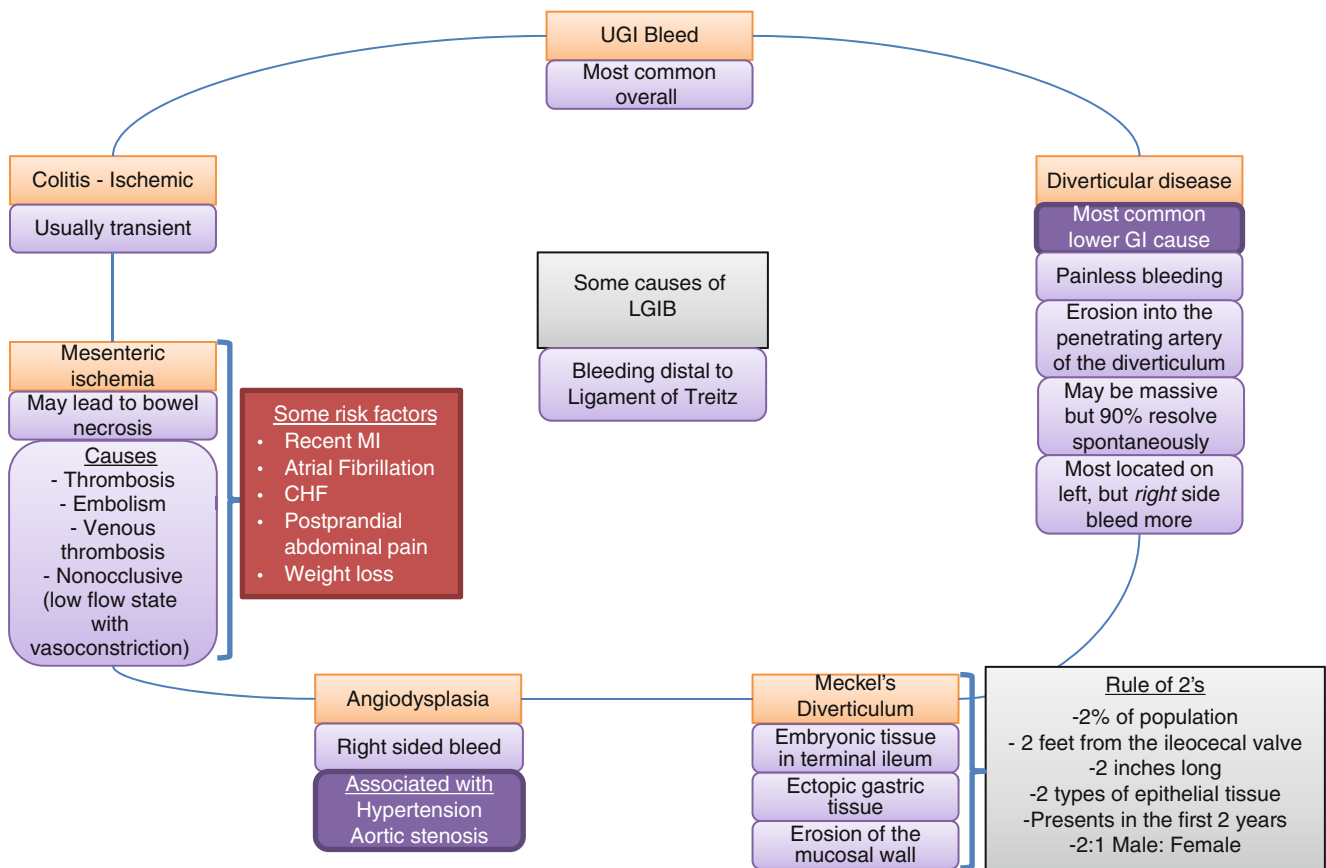
Image just left of center (Reprinted from Allen B, Ganti L, Desai B. GI bleeding/hemorrhage. In: Allen B, Ganti L, Desai B, editors. Quick hits in emergency medicine. New York: Springer Science; 2013. p. 83–5. With permission from Springer Science + Business Media)



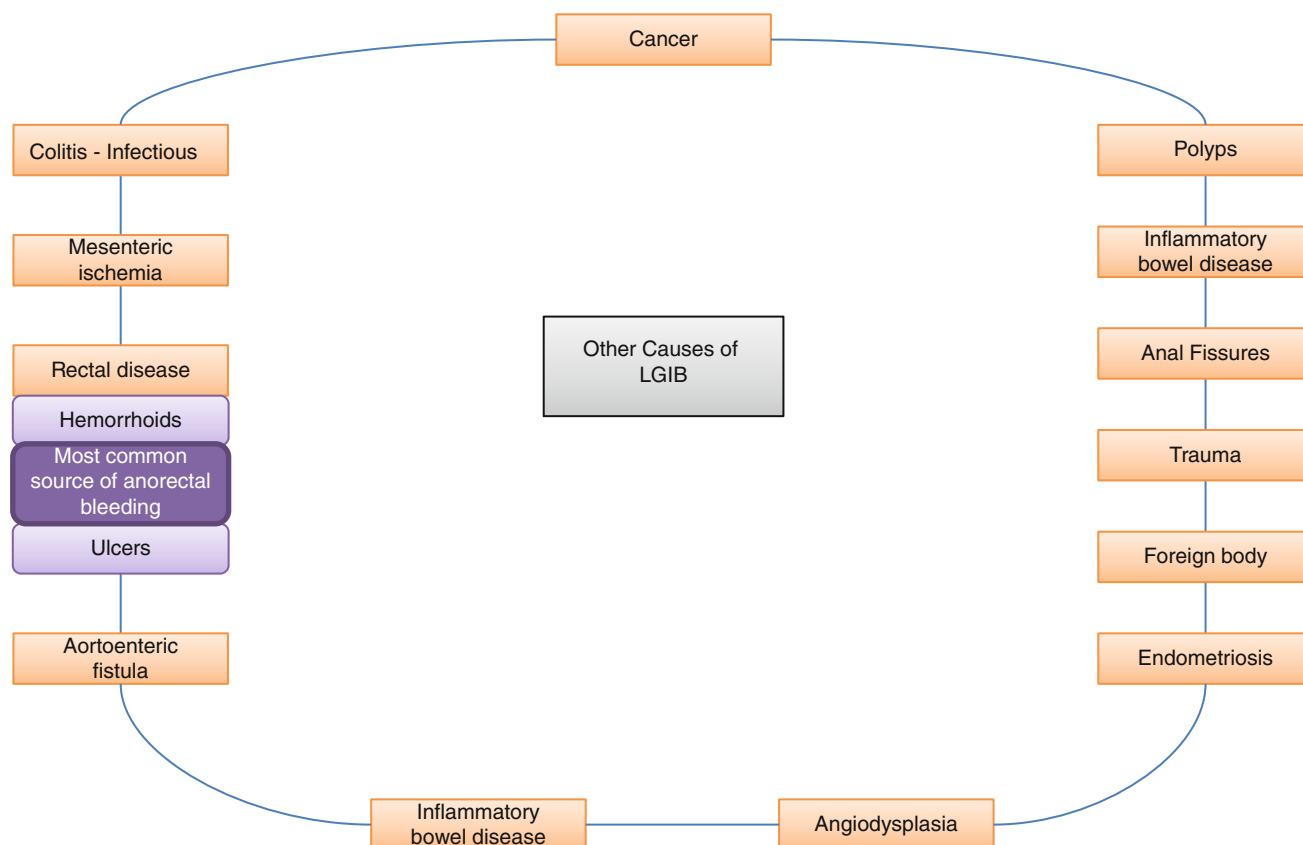
Introduction: Lower GI Bleed (LGIB)



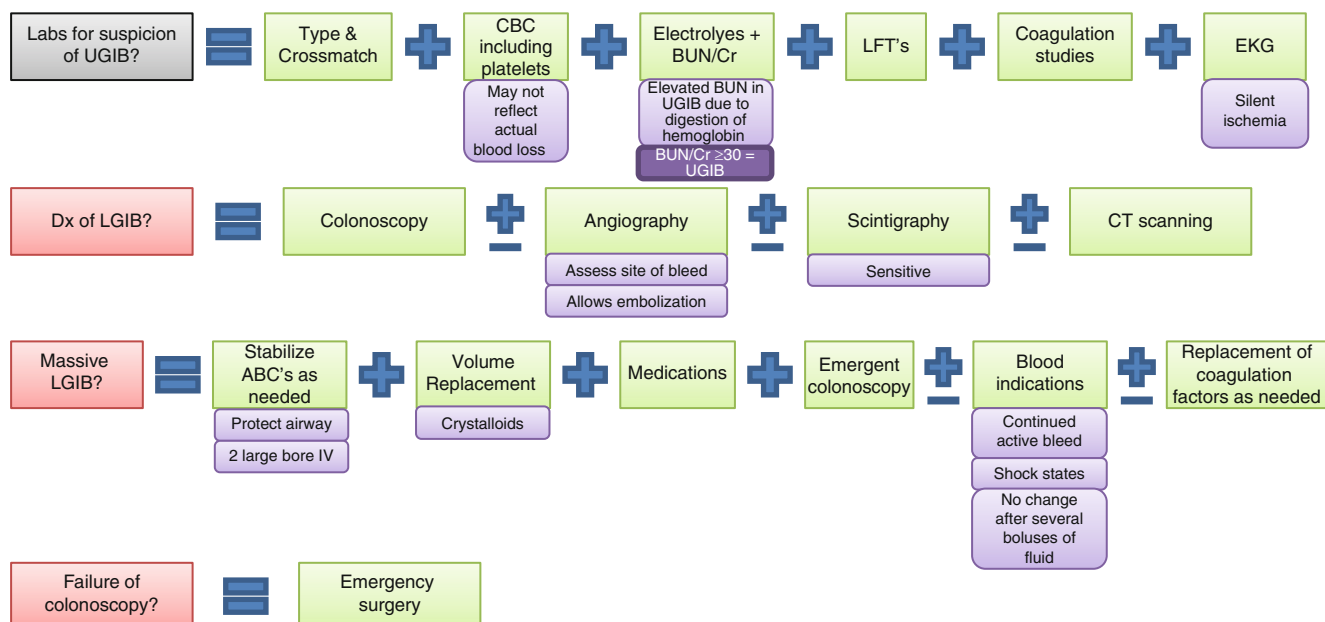
Some Causes of LGIB



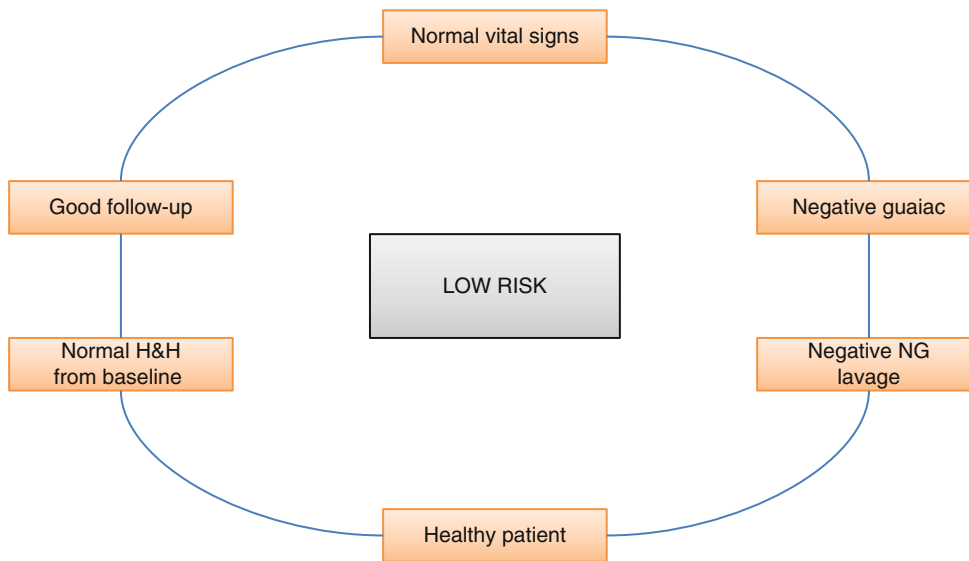
Other Causes of LGIB



LGIB Diagnosis and Treatment

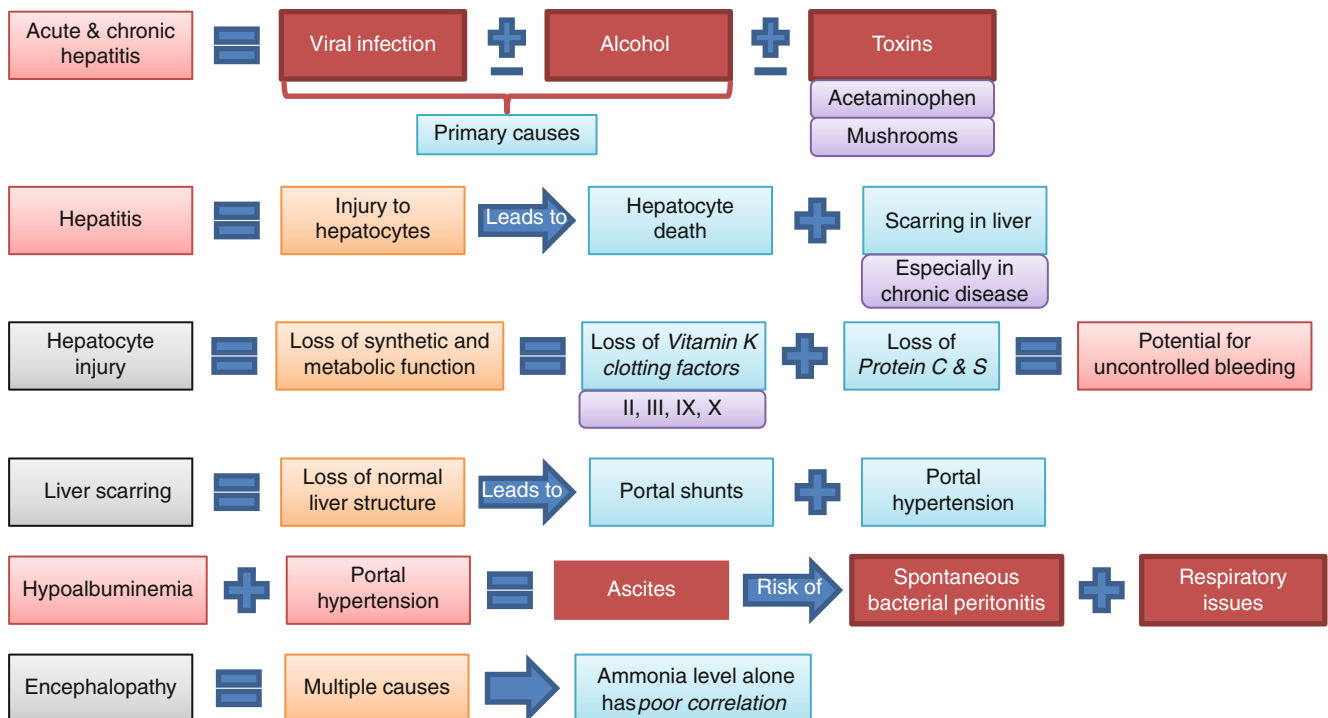


Disposition

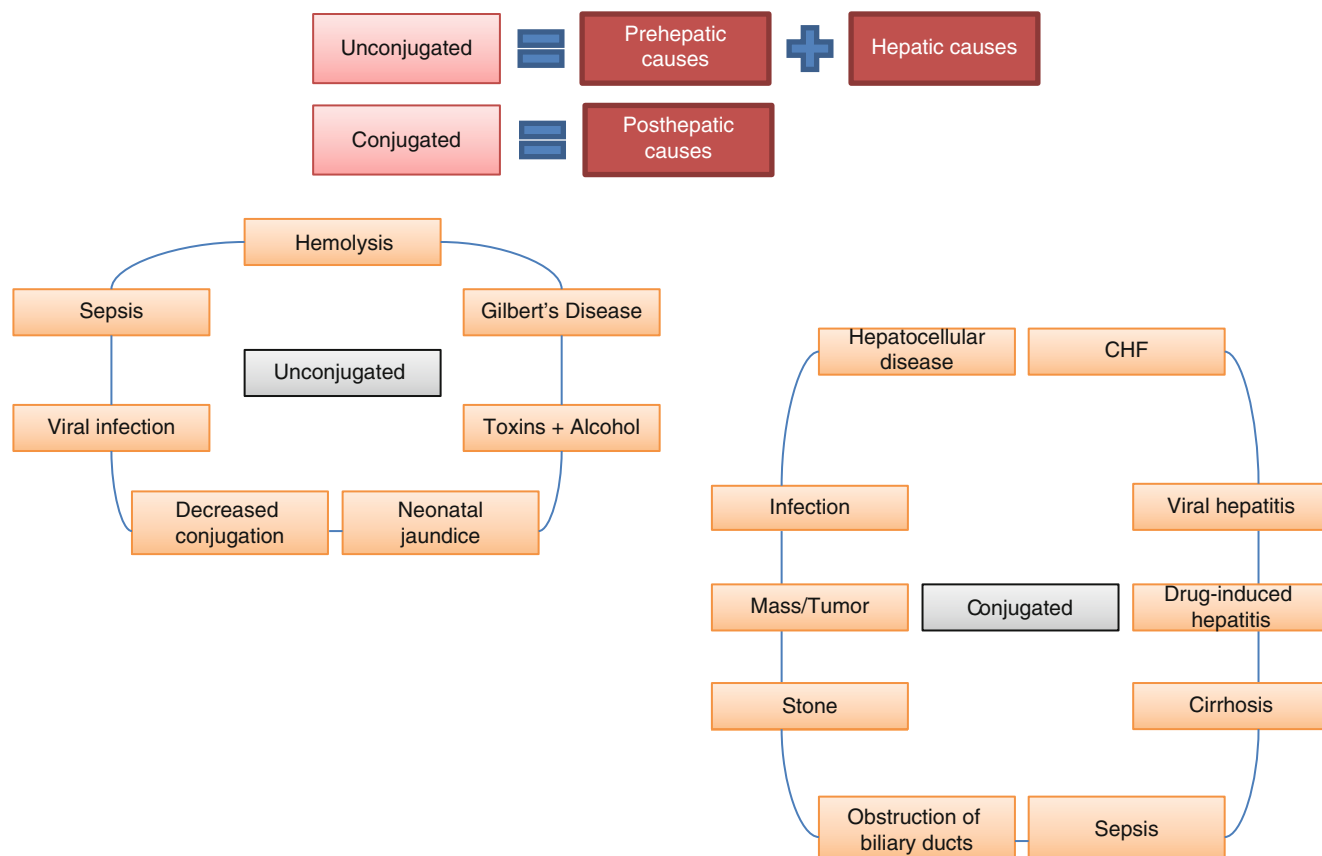


Liver and Gallbladder

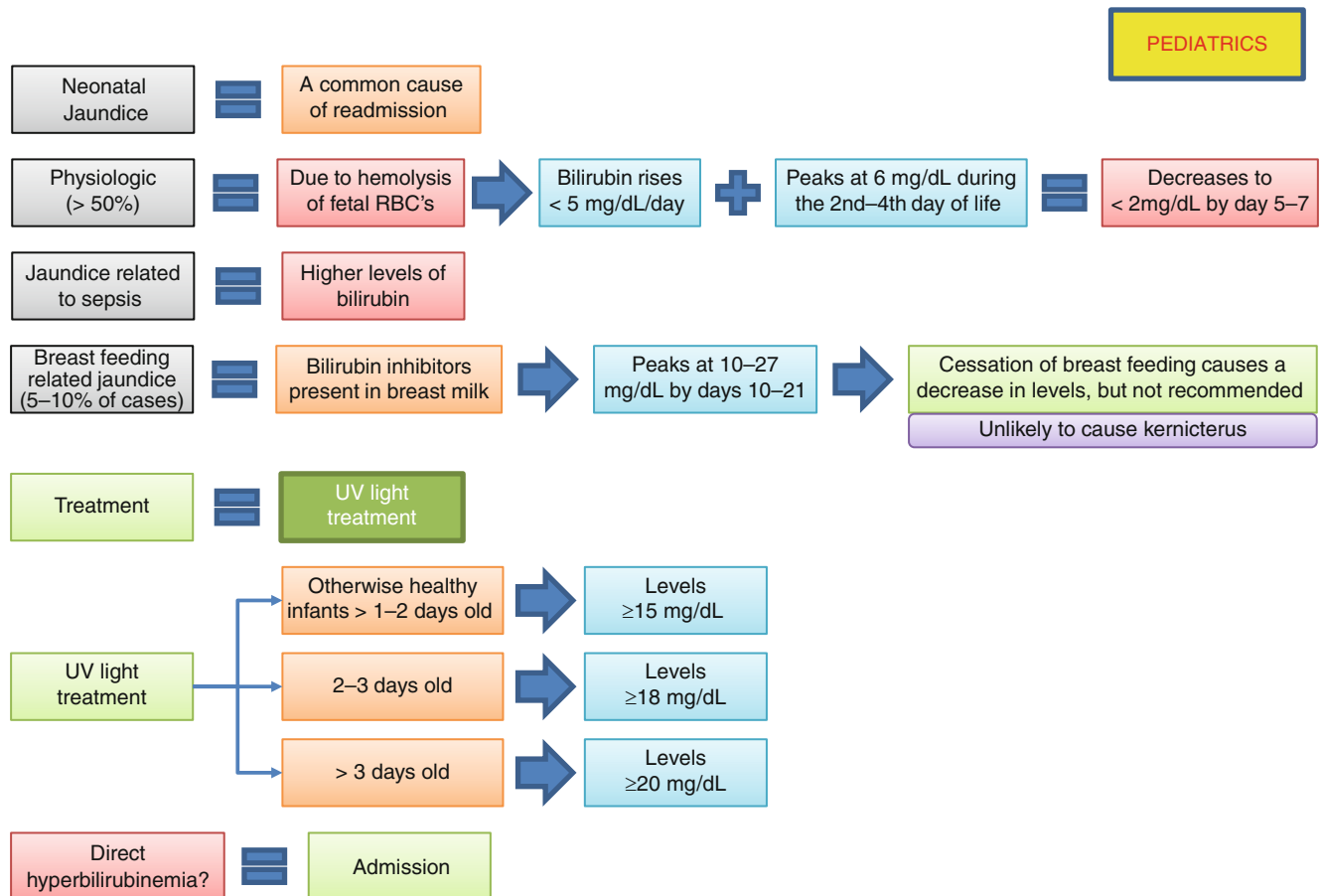
Introduction: Liver



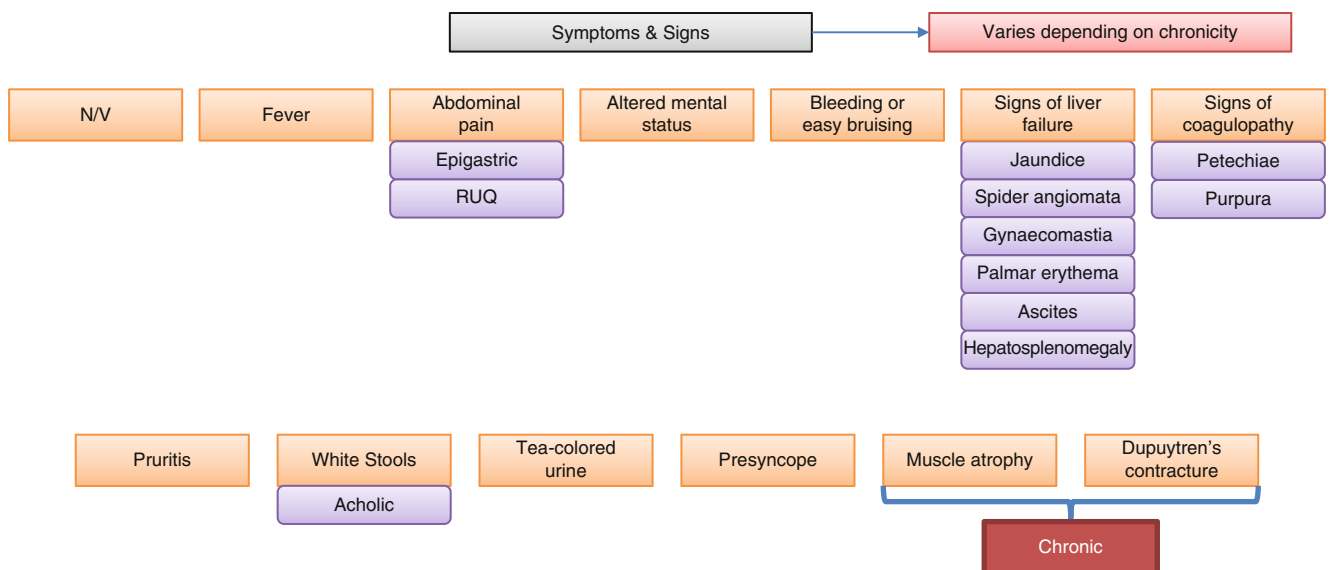
Bilirubin Evaluation



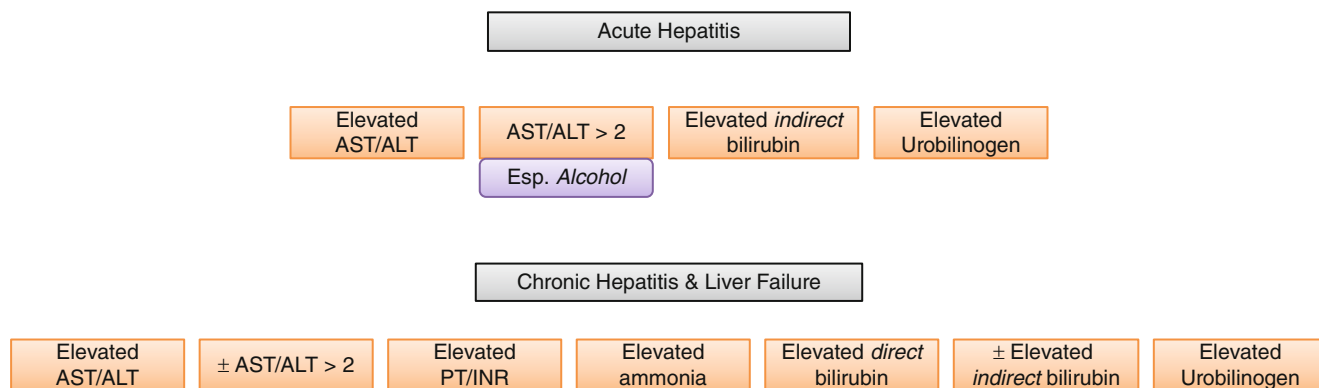
Neonatal Jaundice



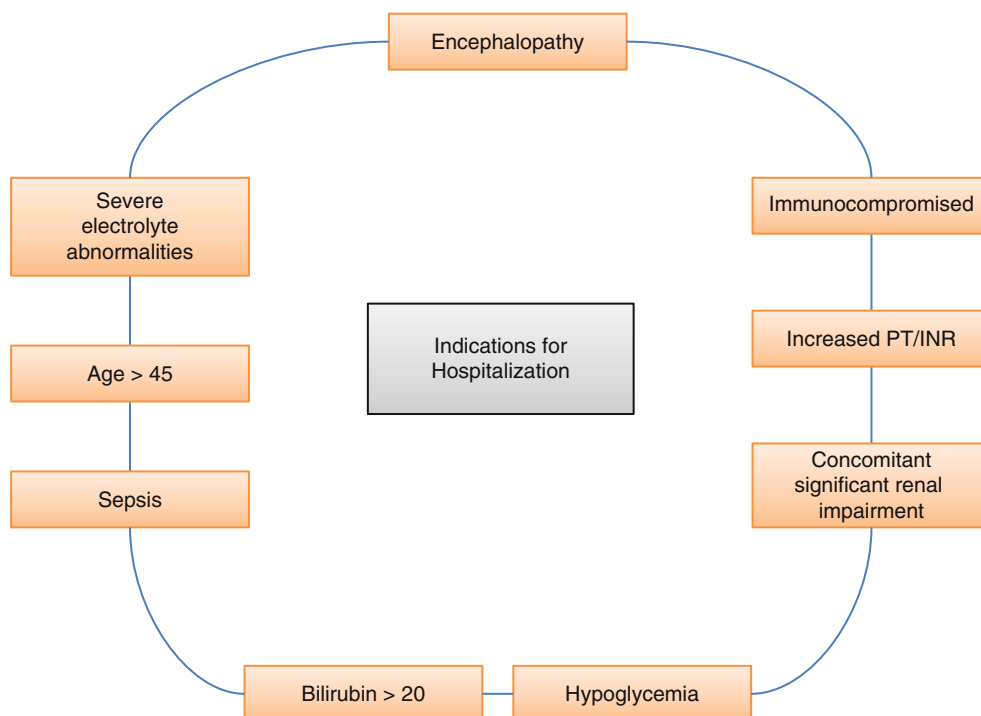
Hepatitis Symptoms and Signs



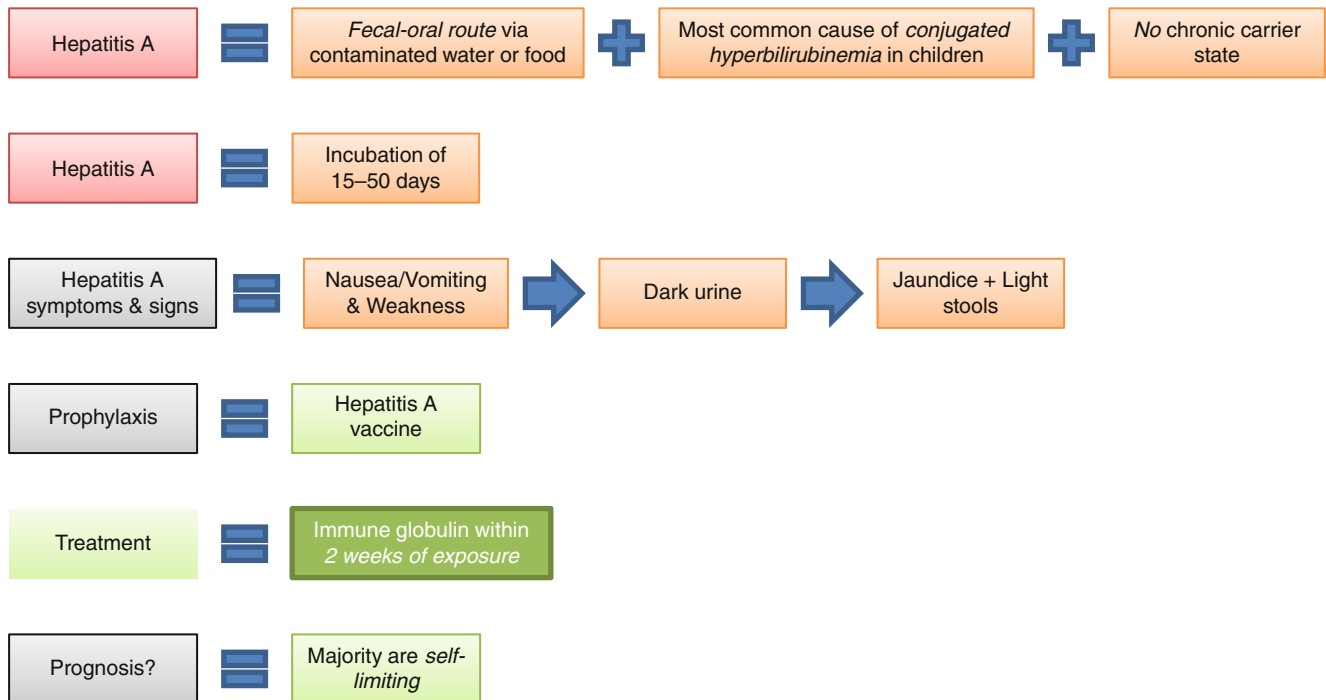
Laboratory Abnormalities in Hepatitis



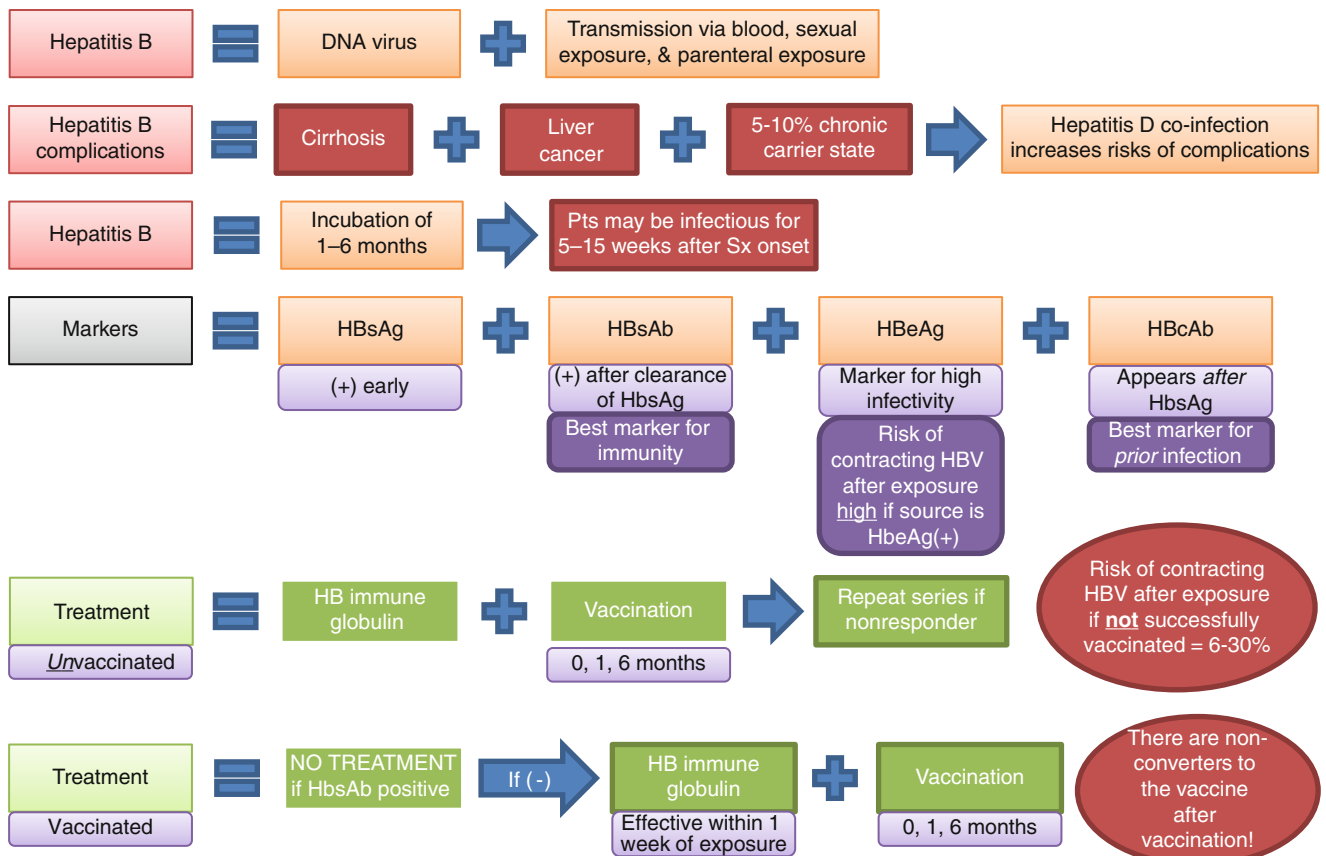
Indications for Hospitalization for Any Hepatitis



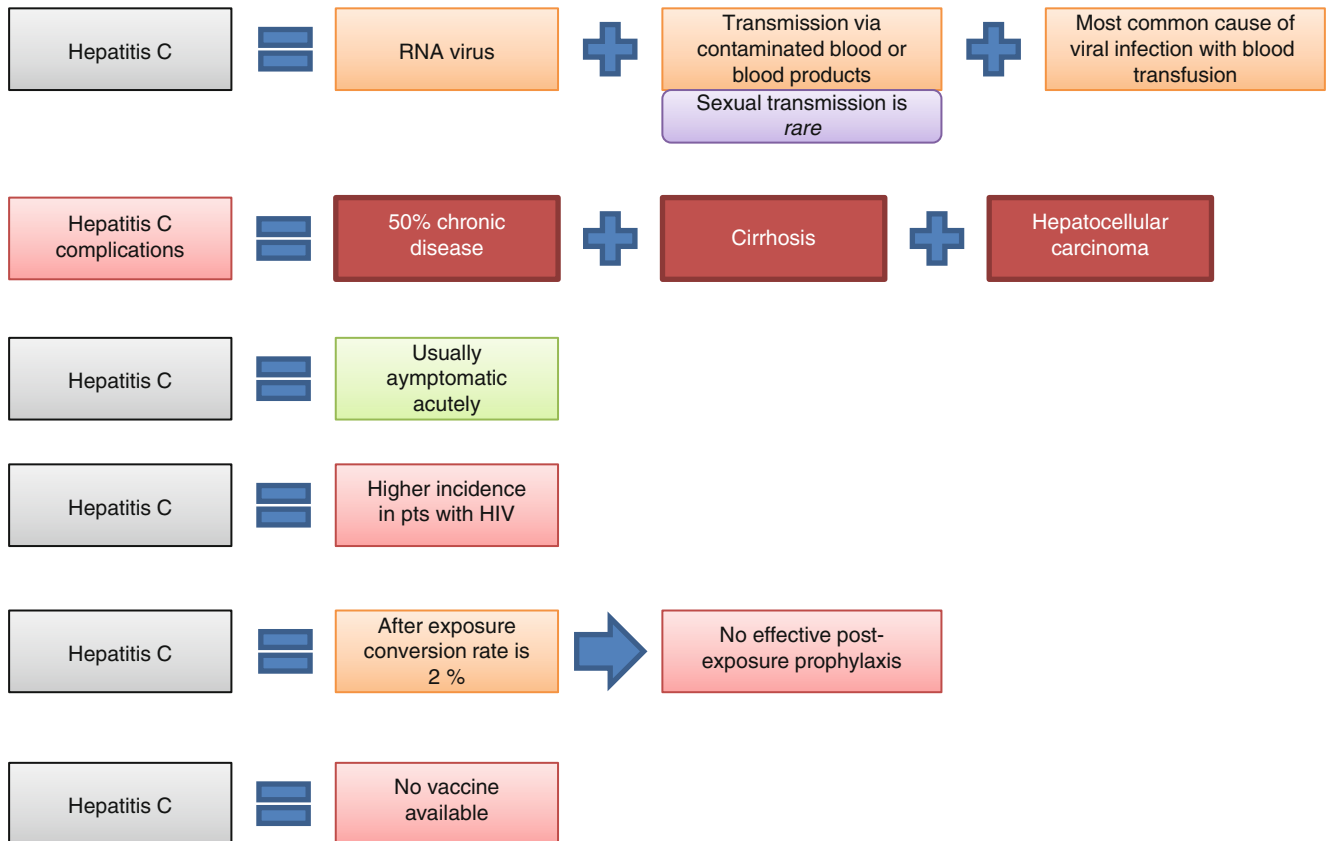
Hepatitis A



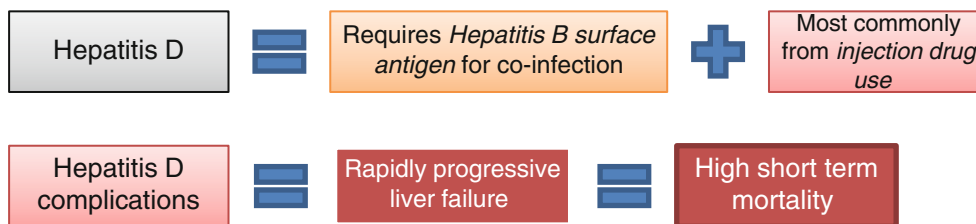
Hepatitis B



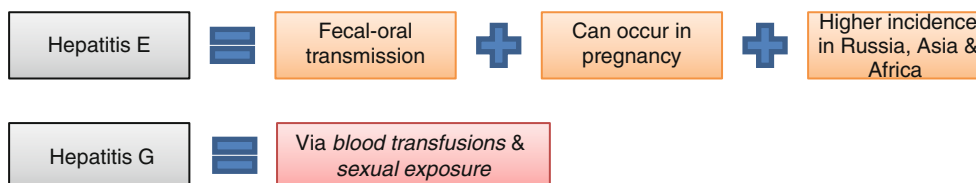
Hepatitis C



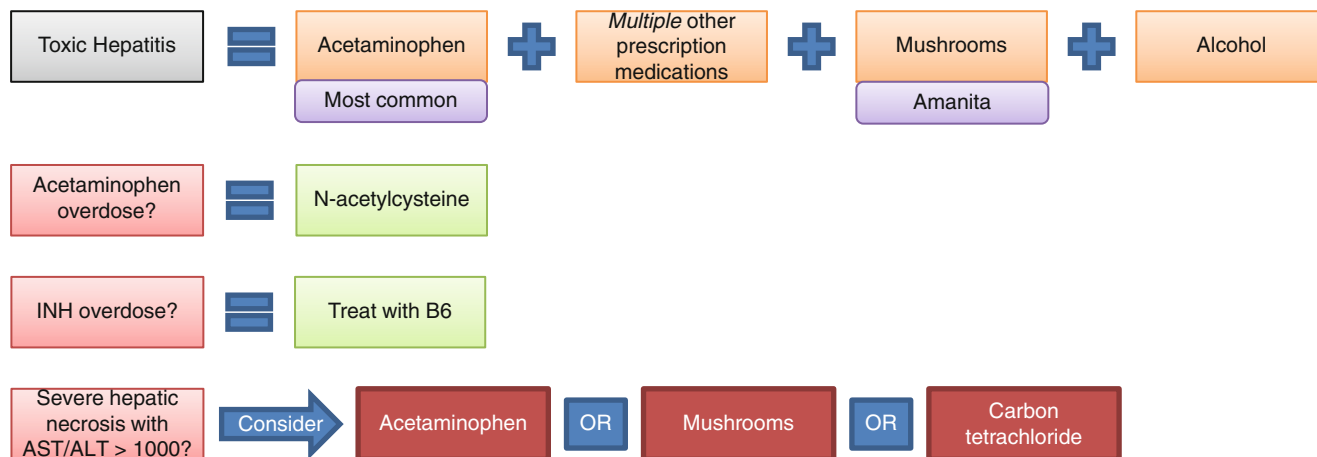
Hepatitis D



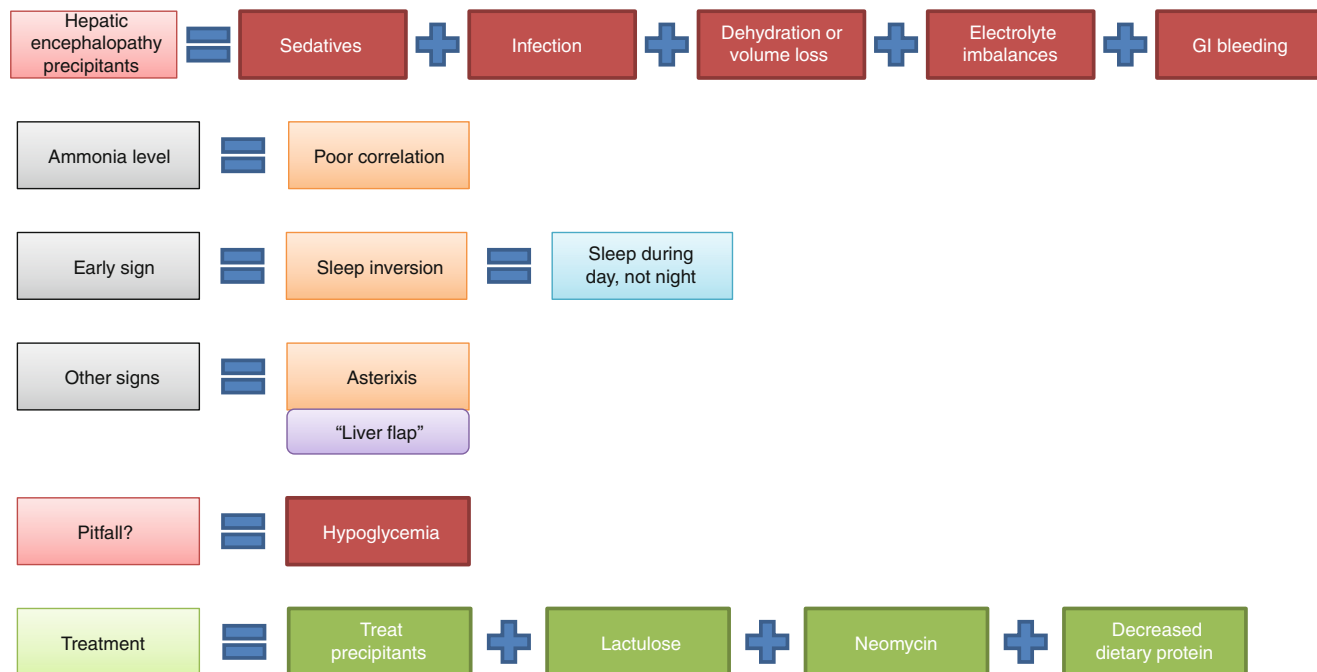
Hepatitis E and G



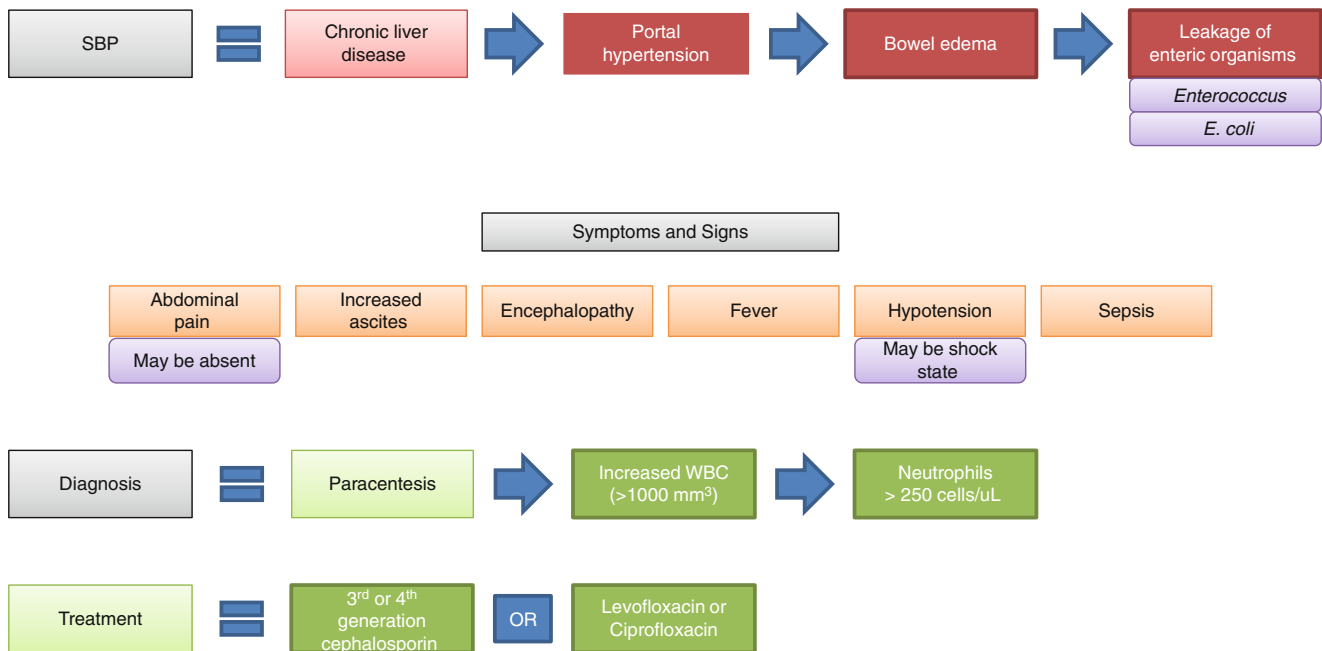
Toxic Hepatitis



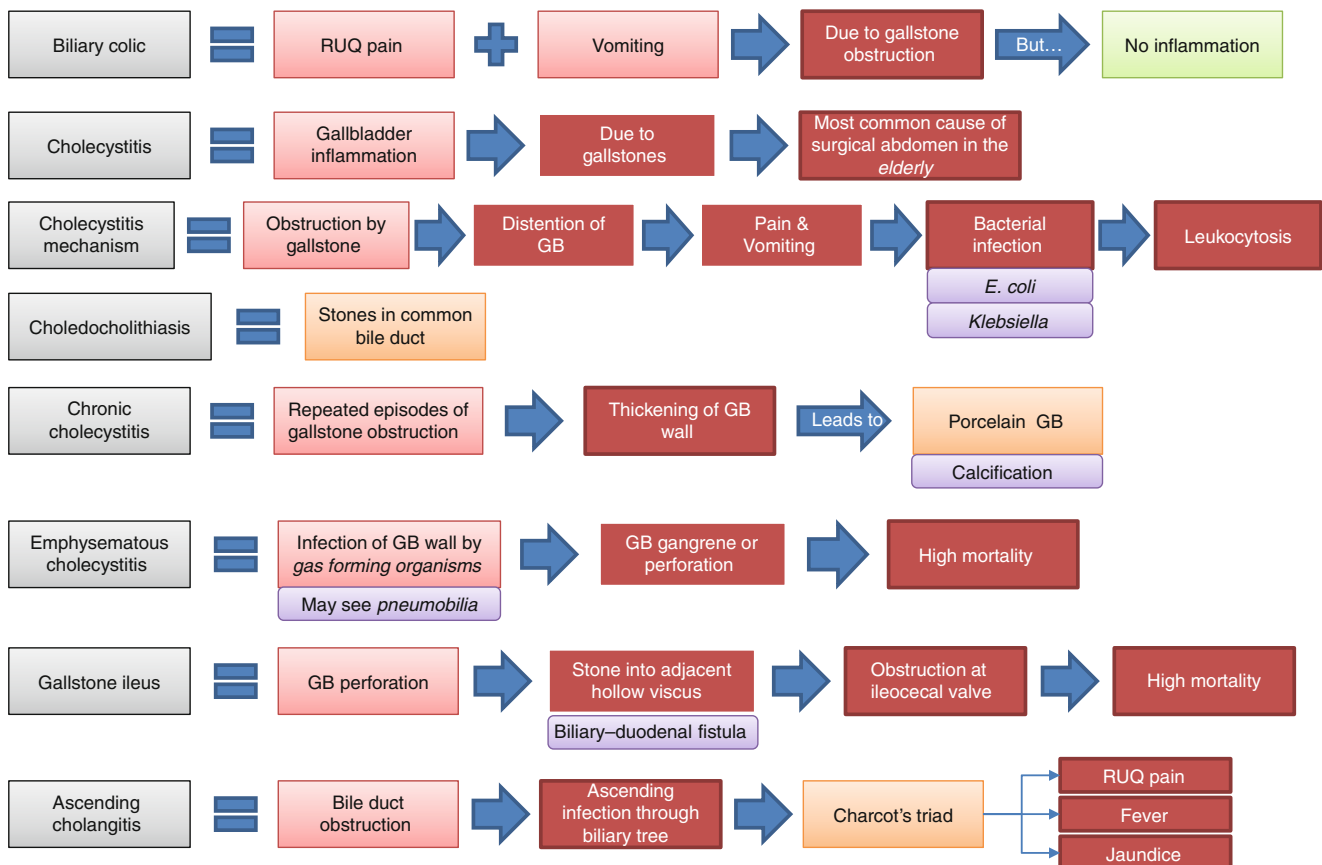
Hepatic Encephalopathy



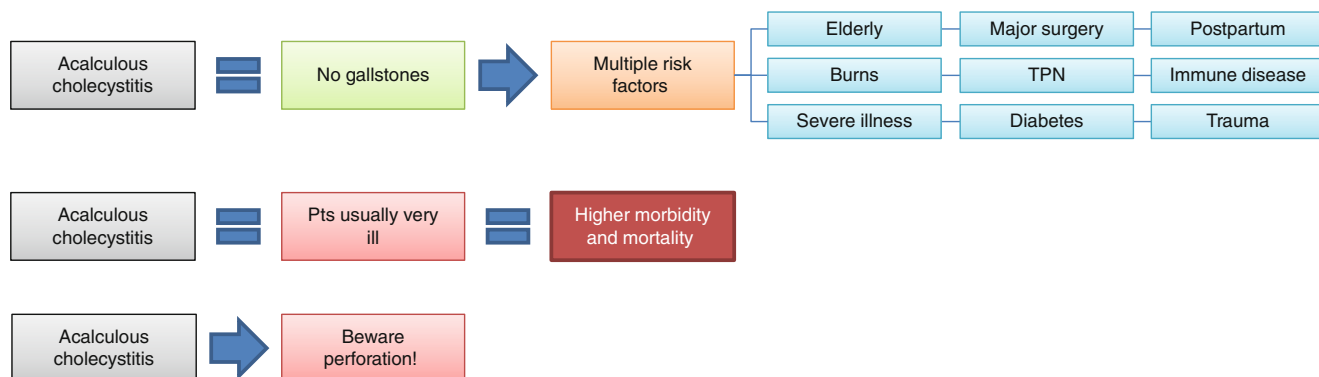
Spontaneous Bacterial Peritonitis



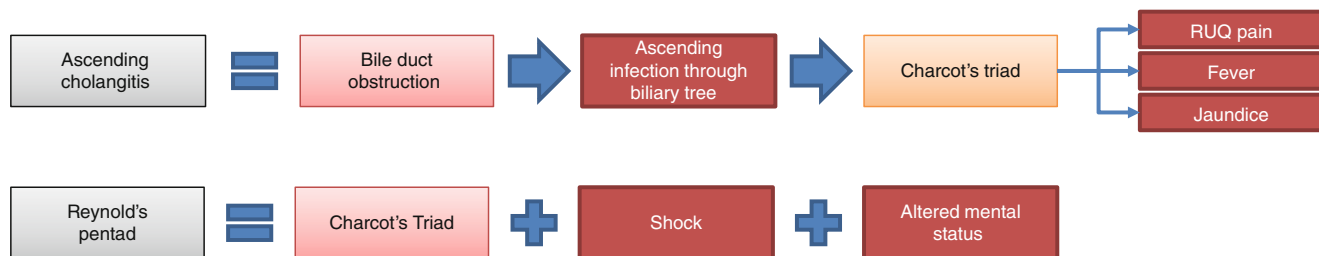
Introduction: Gallbladder



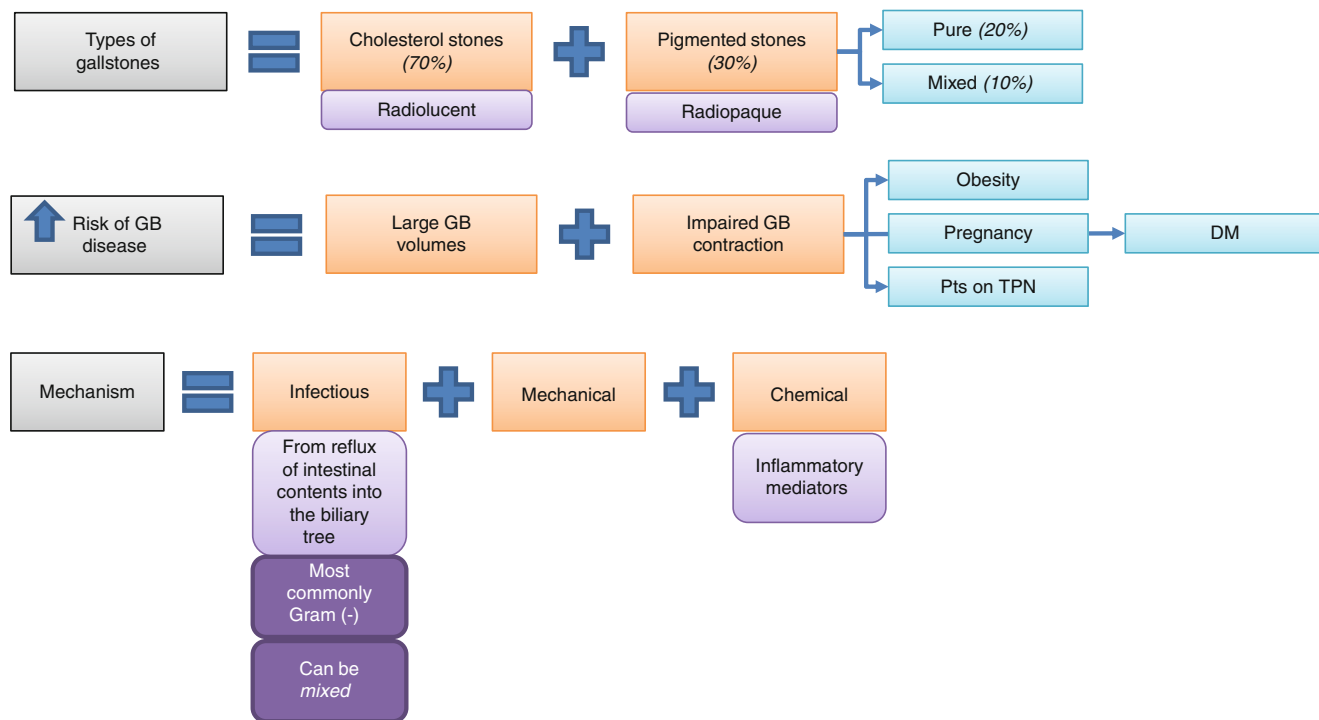
Acalculous Cholecystitis



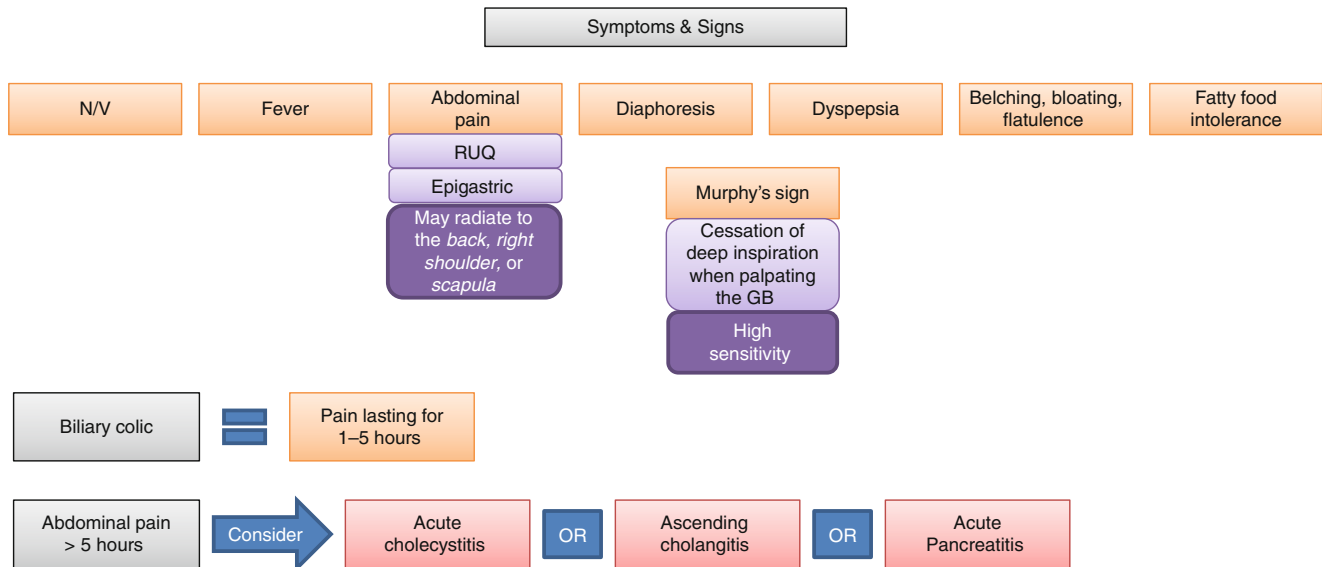
Ascending Cholangitis



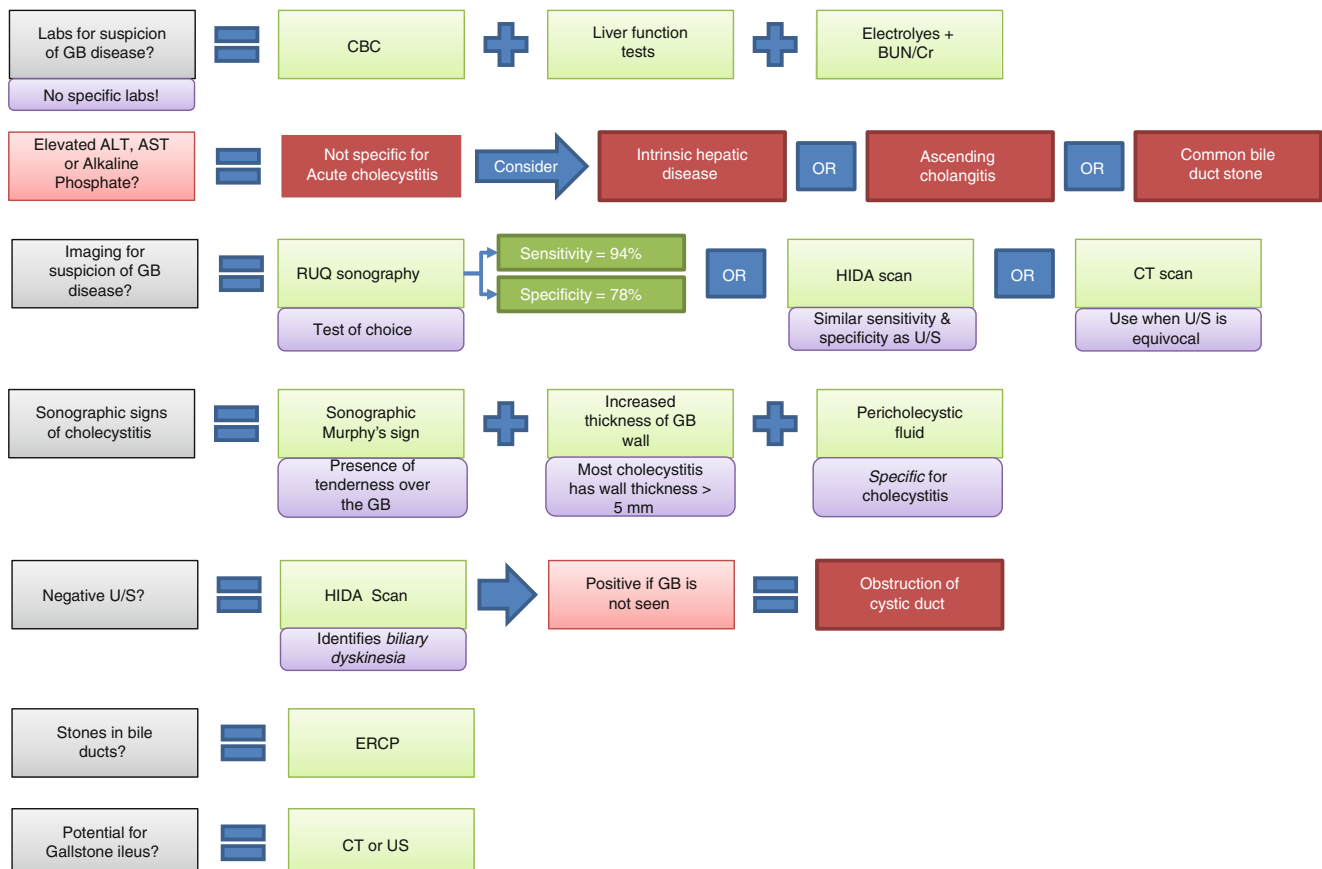
Pathophysiology



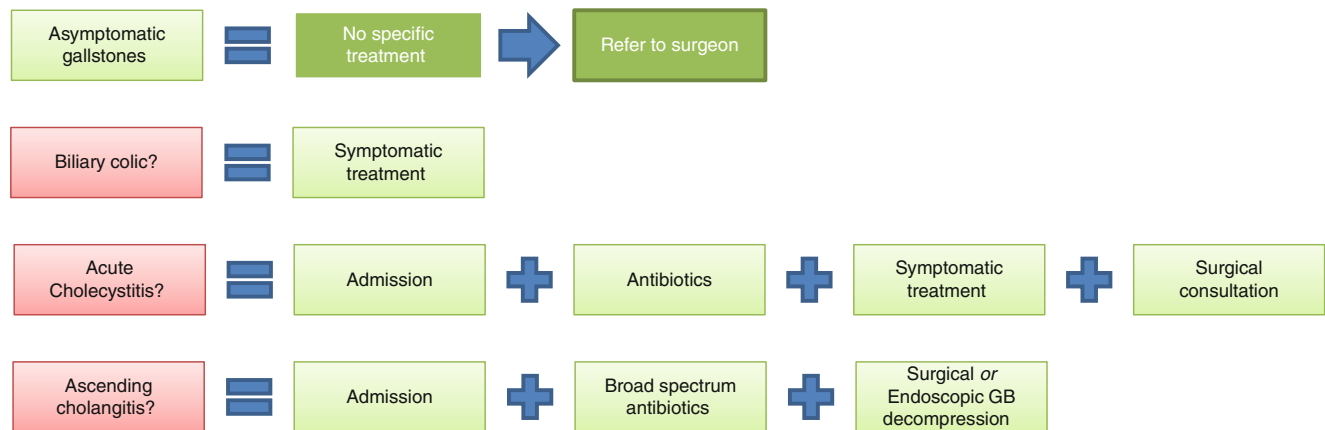
Symptoms and Signs



Diagnosis

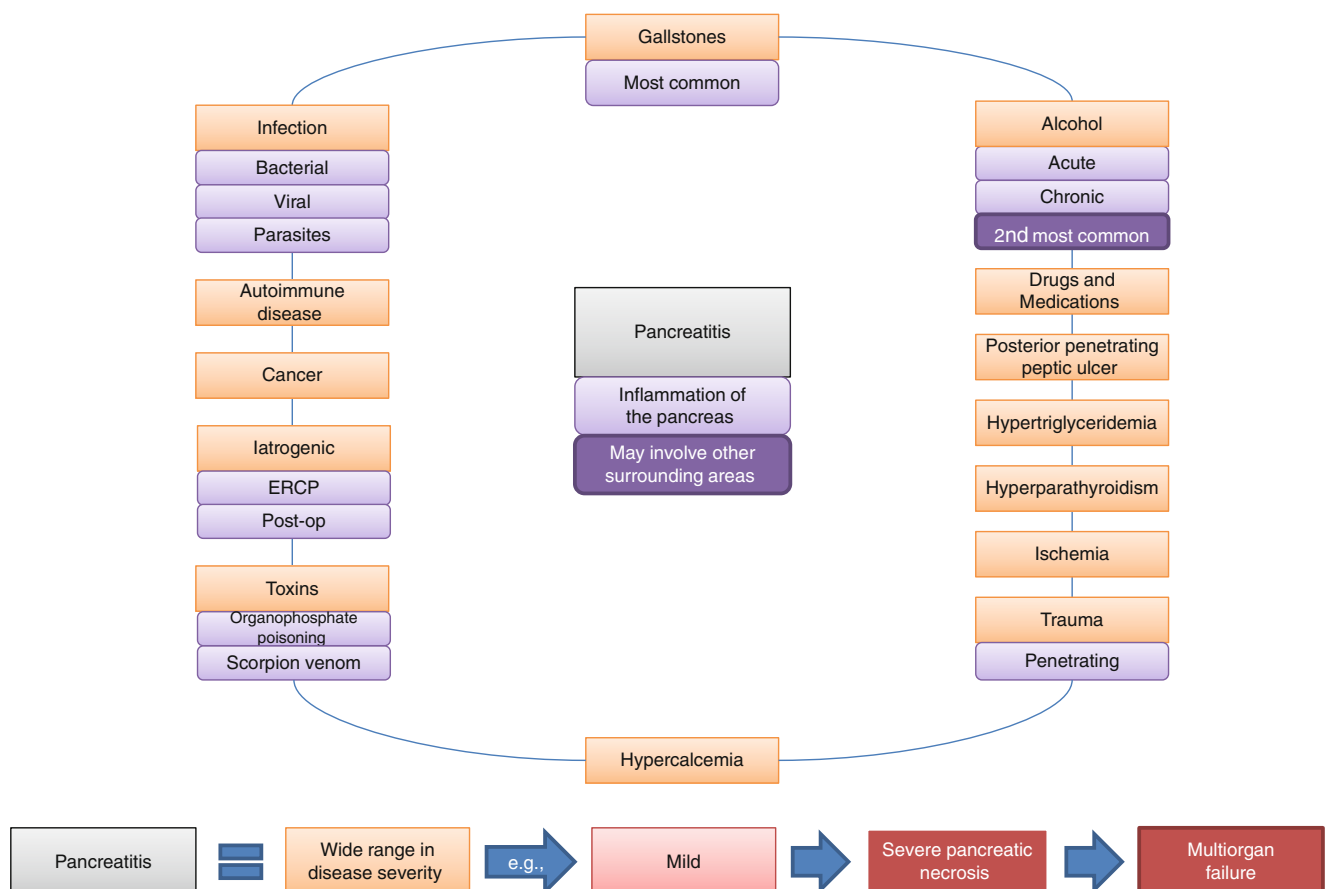


Treatment

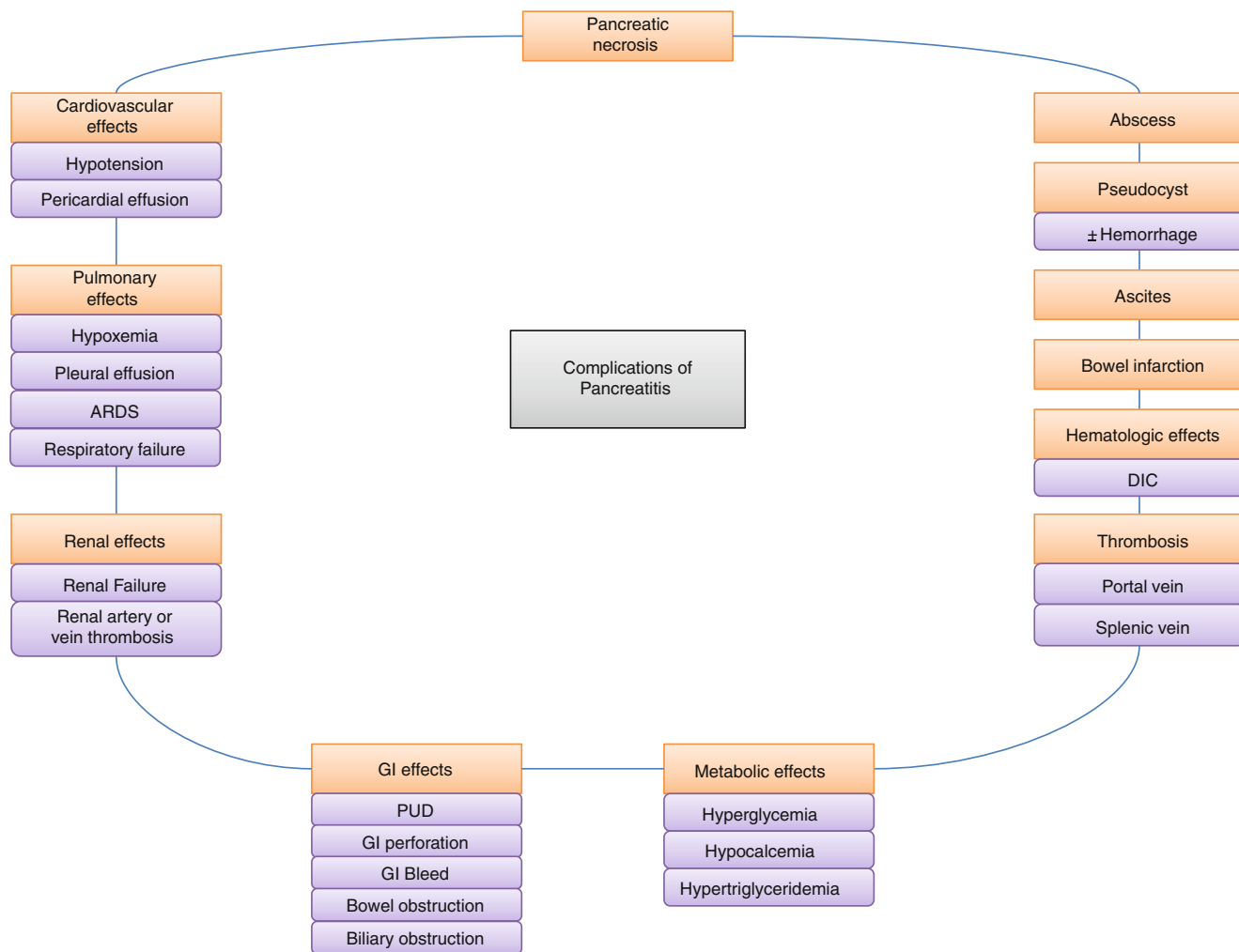


Pancreatitis

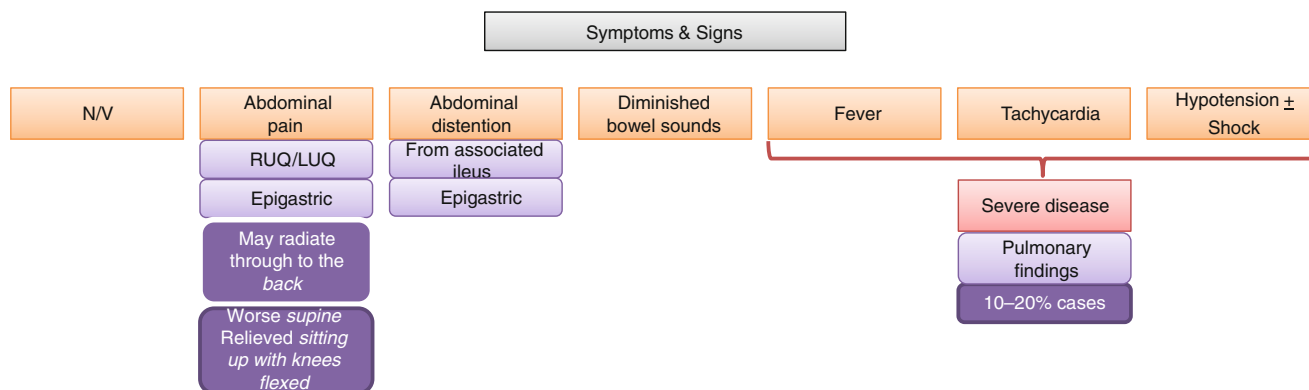
Introduction and Some Causes of Pancreatitis



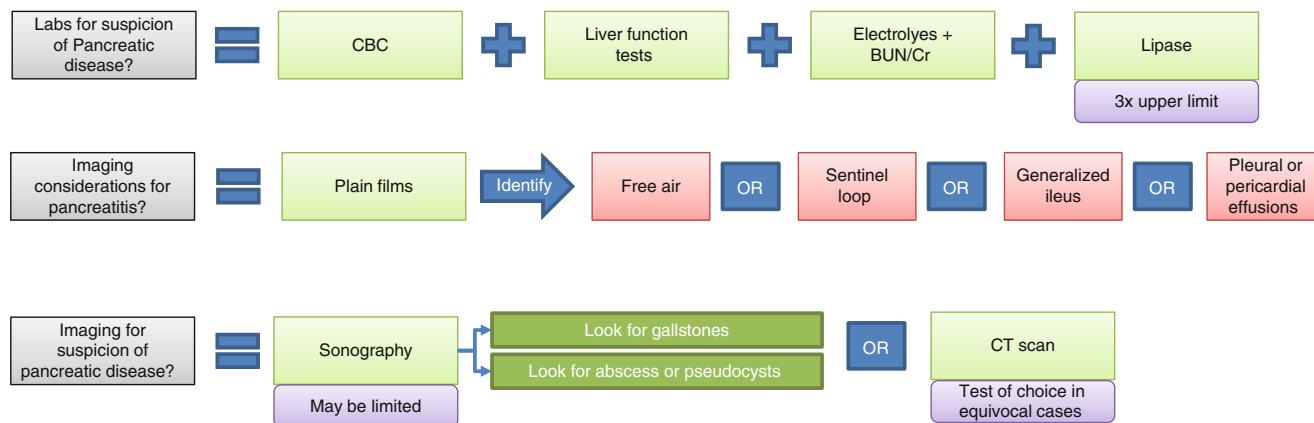
Complications of Pancreatitis



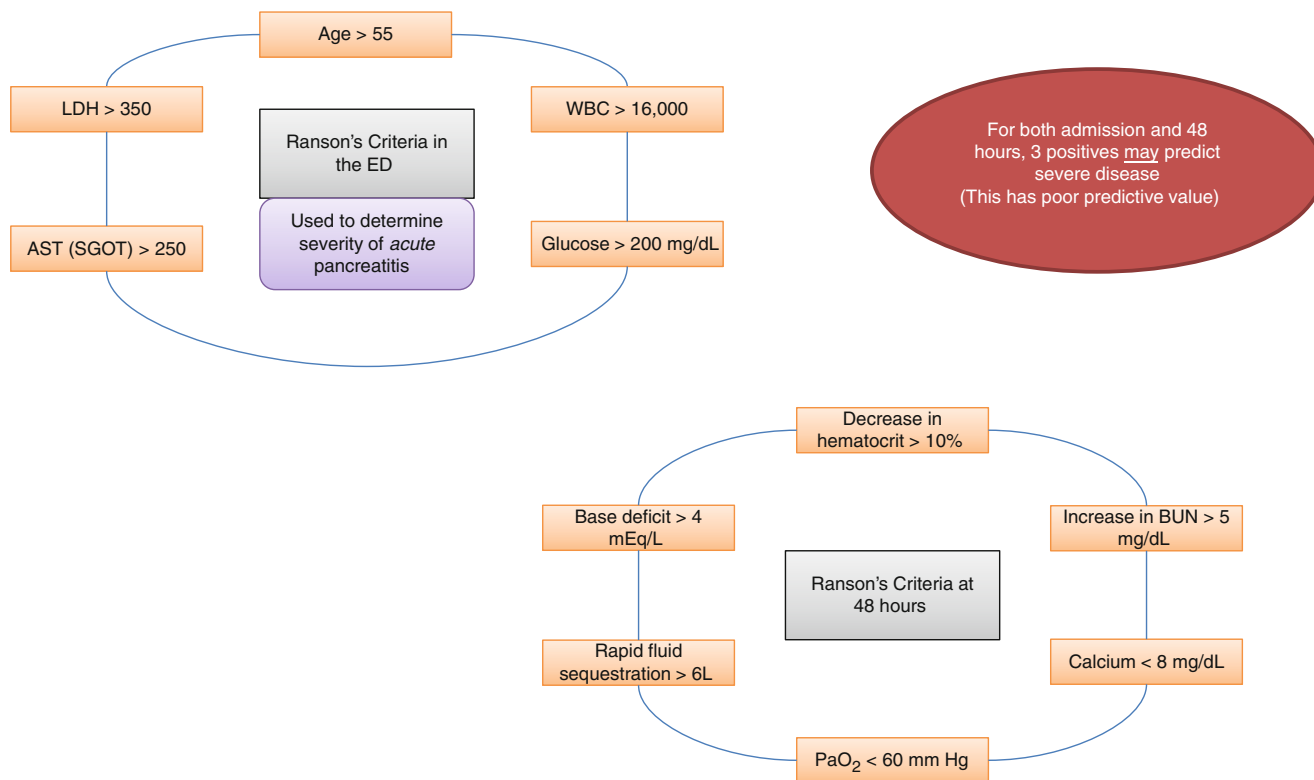
Symptoms and Signs



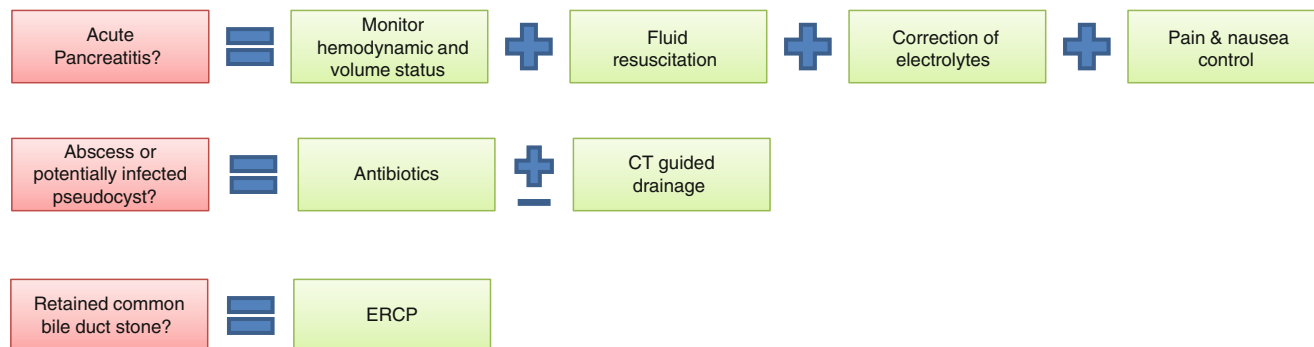
Diagnosis



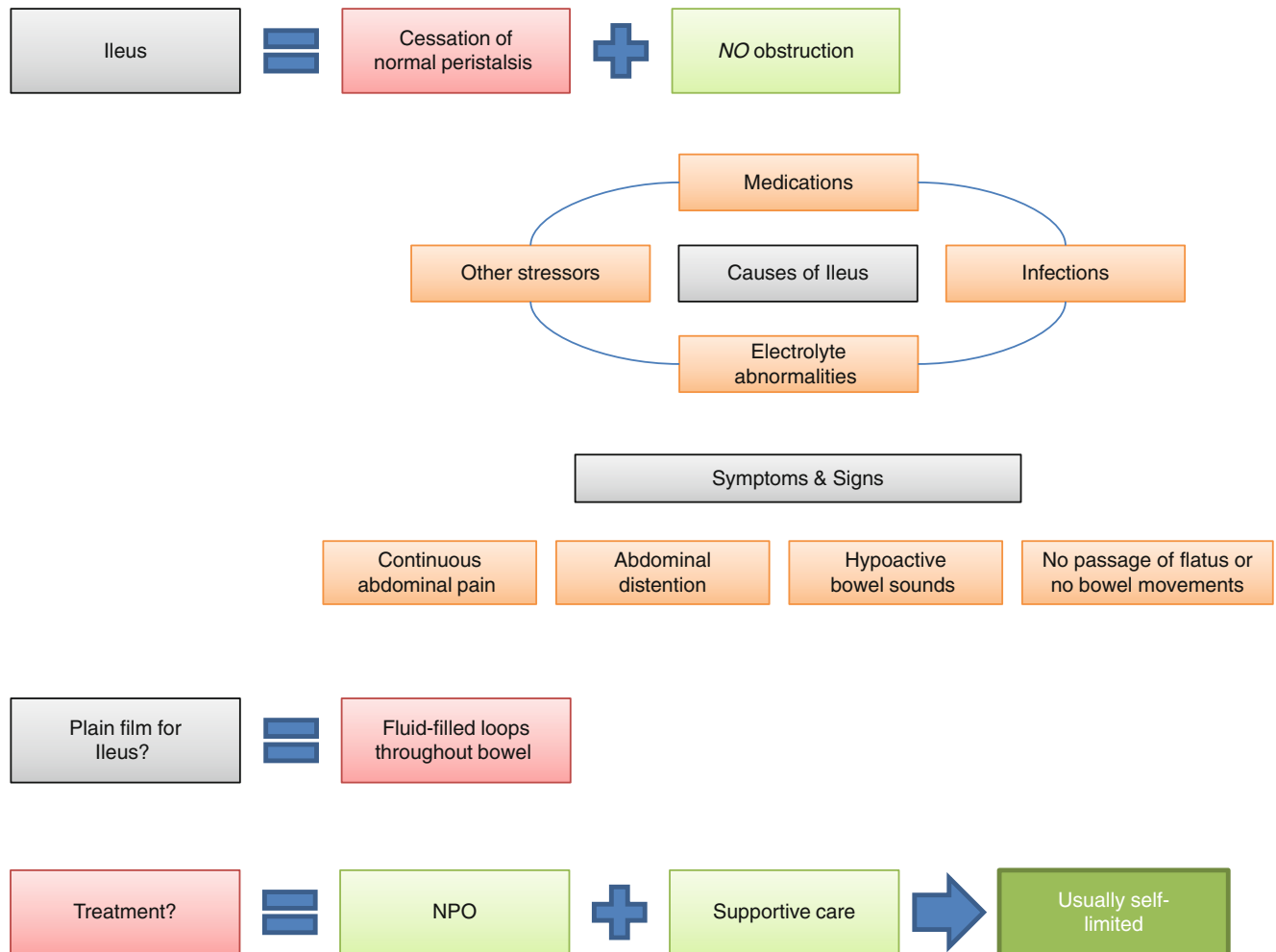
Ranson's Criteria: At Admission and 48 h



Treatment

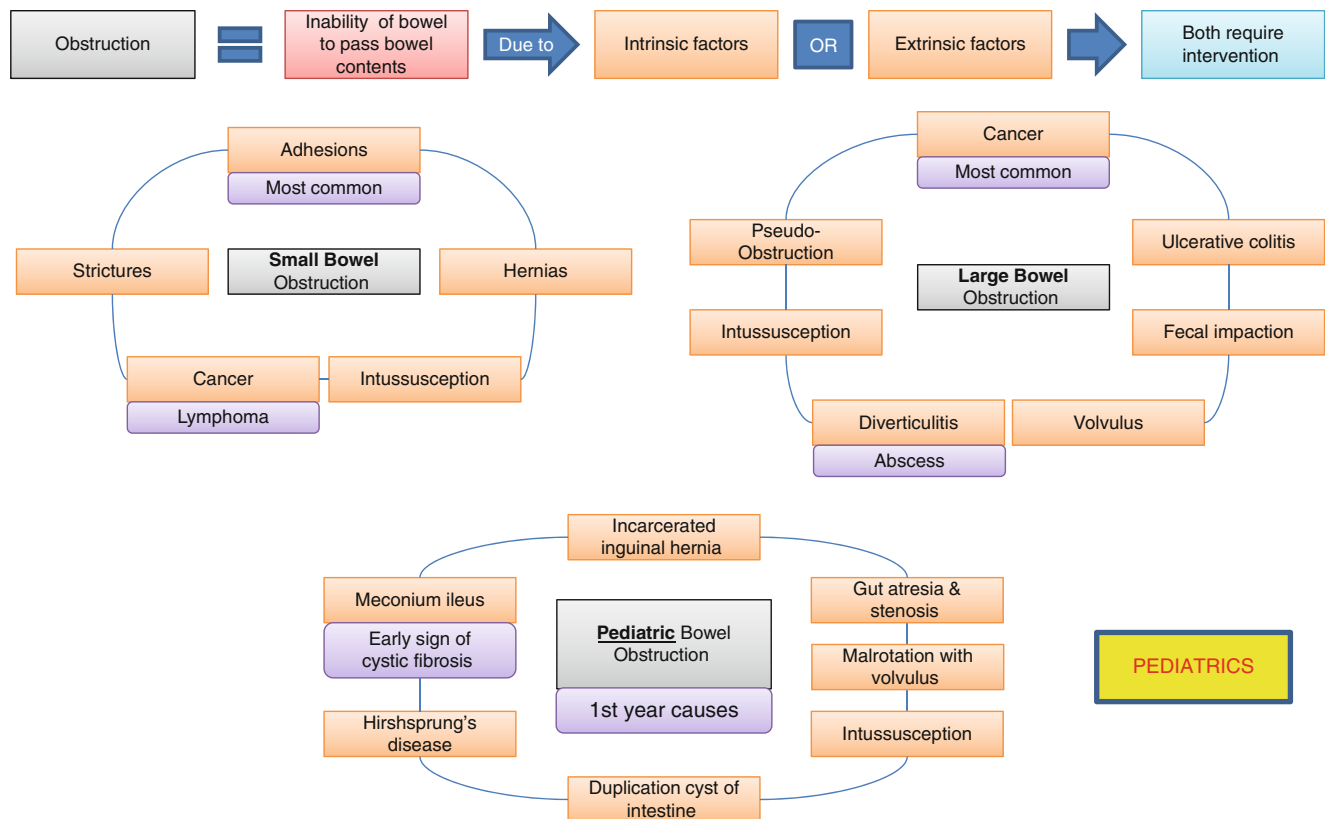


Ileus

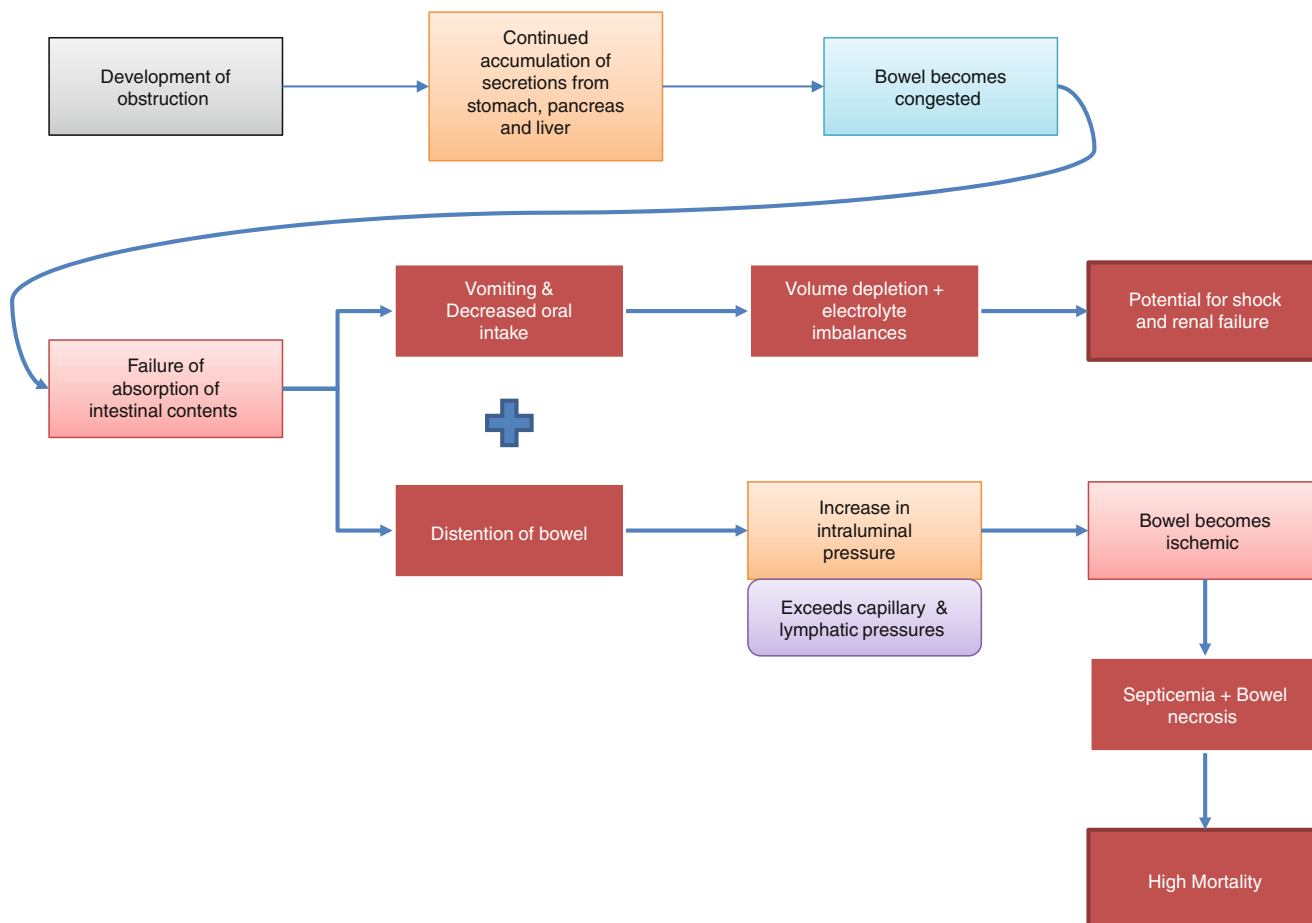


Bowel Obstruction

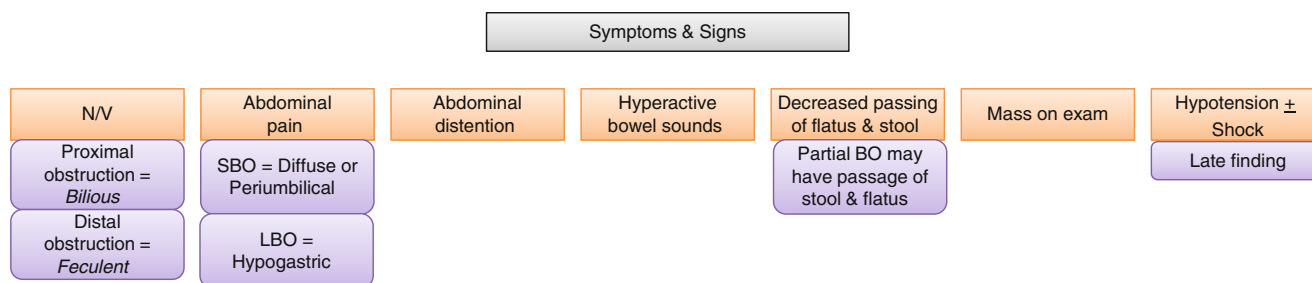
Introduction and Causes



Bowel Obstruction Pathophysiology

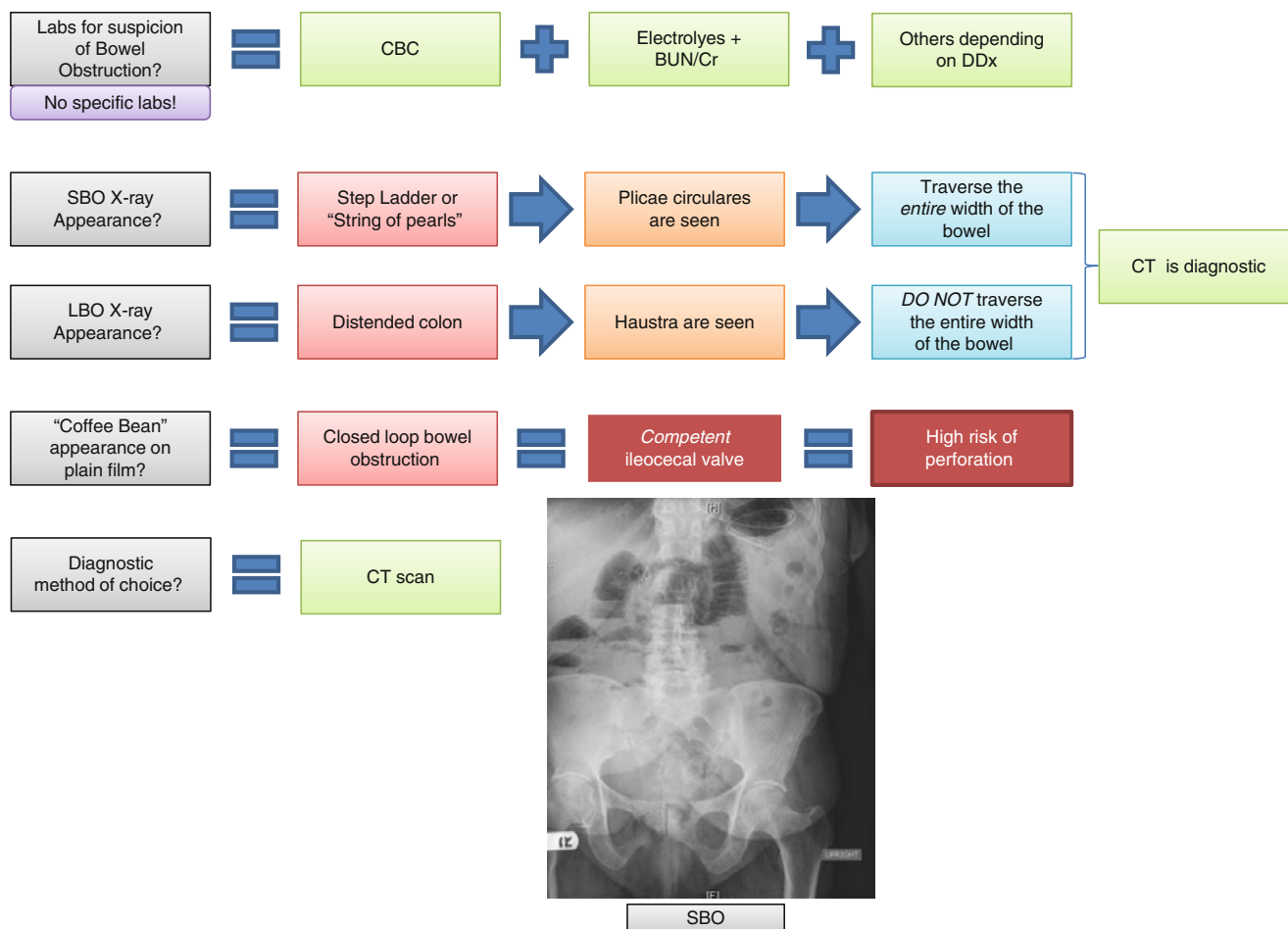


Symptoms and Signs

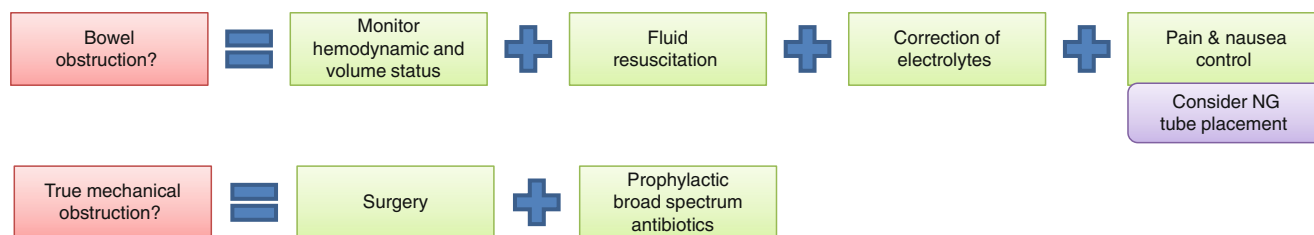


Diagnosis

Center bottom image (Reprinted from Pelaez CA, Agarwal N. The surgical abdomen. In: Pitchumoni CS, Dharmarajan TS, editors. Geriatric gastroenterology. New York: Springer Science; 2012. 607–13. With permission from Springer Science + Business Media)



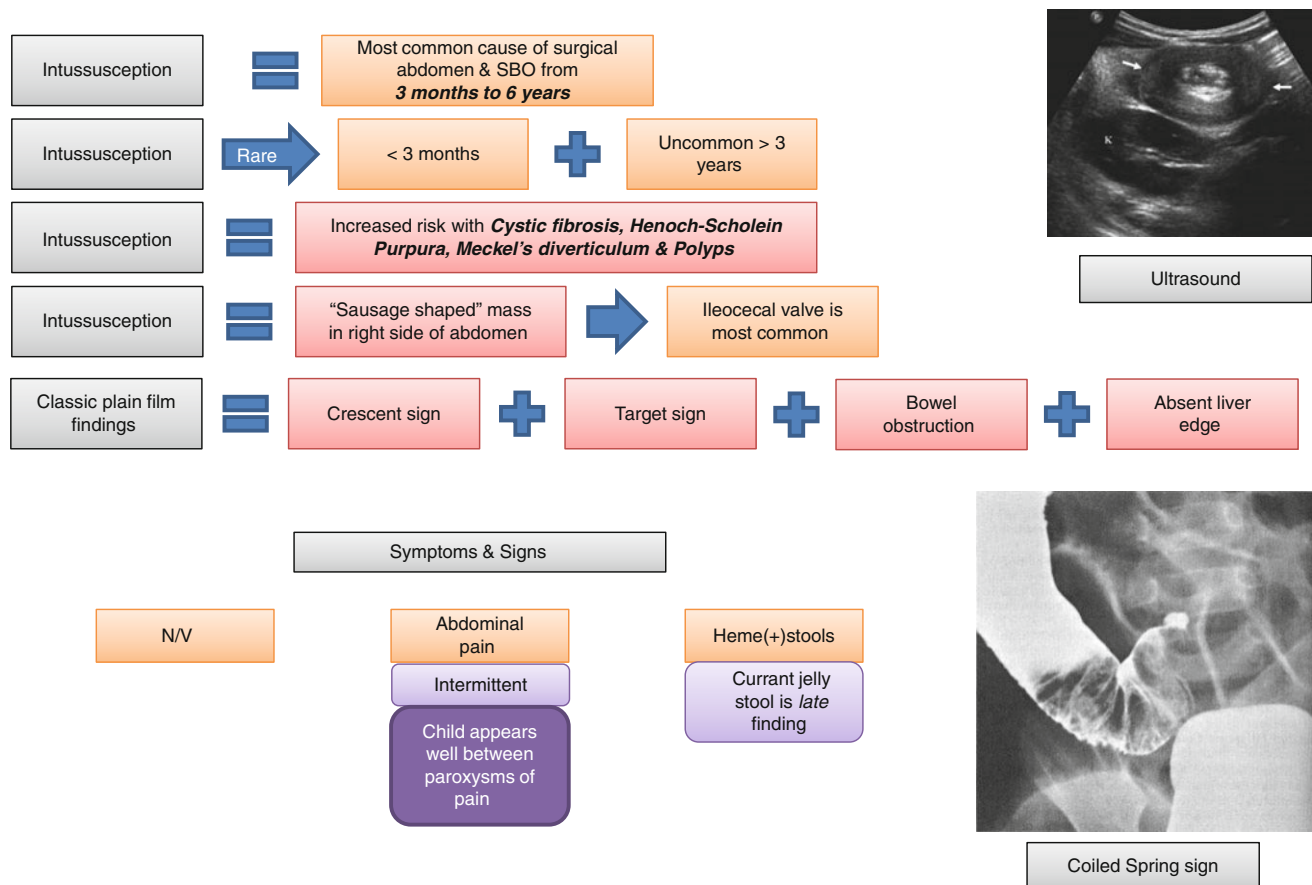
Treatment



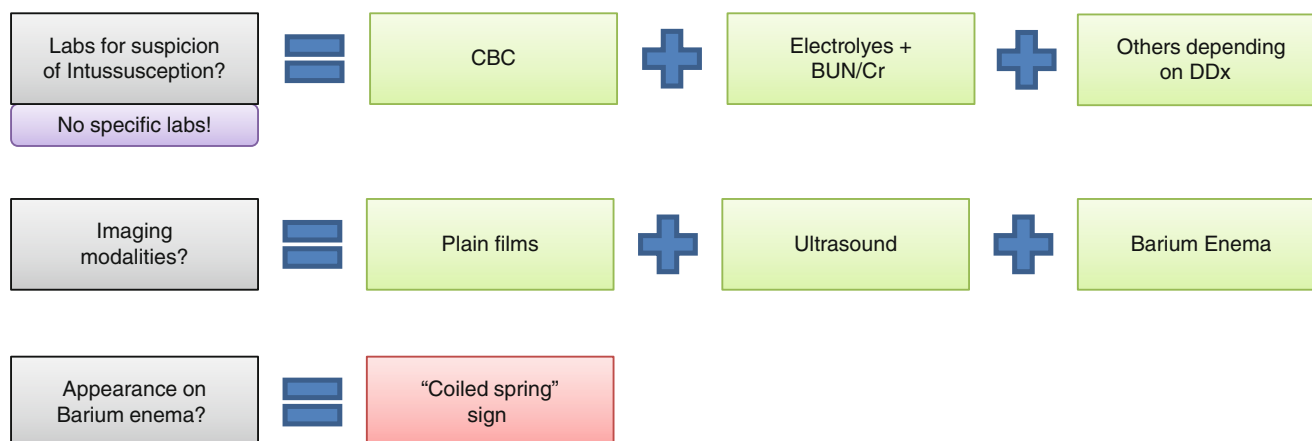
Intussusception

(a) Top right image (Reprinted from Yoo S-Y. Non-neonatal gastrointestinal diseases. In: Kim I-O, editor. Radiology illustrated: pediatric radiology. Heidelberg: Springer Verlag; 2014. p. 629–63. With permission from Springer Verlag).

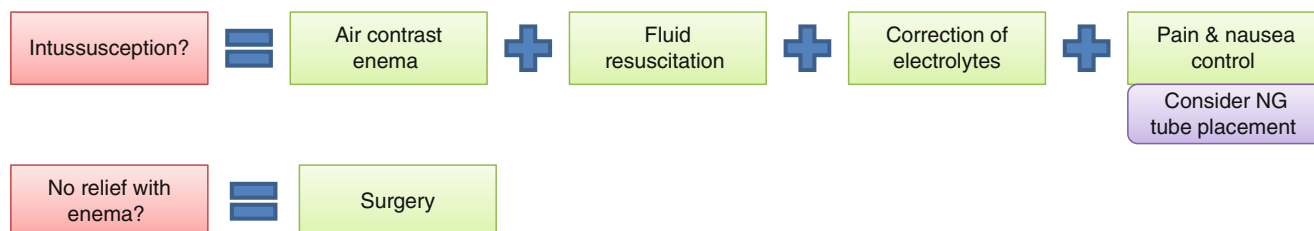
(b) Bottom right image (Reprinted from Gilger MA, Nazer HM. Gastrointestinal bleeding. In: Elzouki AY, Harfi HA, Nazer HM, Stapleton FB, Oh W, Whitley RJ, editors. Textbook of clinical pediatrics. Heidelberg: Springer Verlag; 2012. p. 1937–49. With permission from Springer Verlag)



Diagnosis



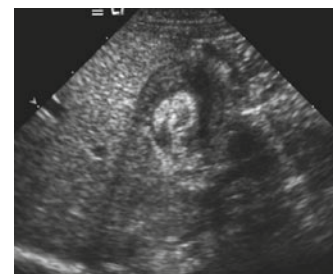
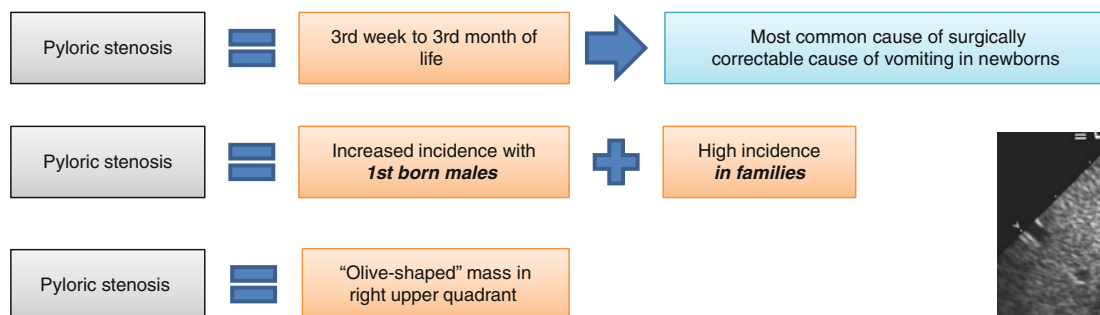
Treatment



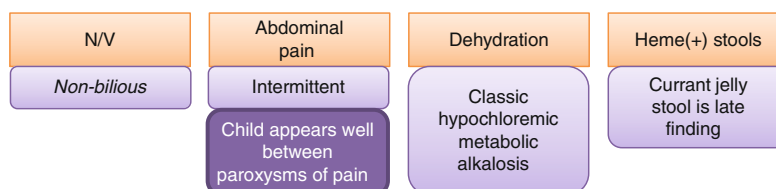
Pyloric Stenosis

Image just right of center (Reprinted from Yoo S-Y. Non-neonatal gastrointestinal diseases. In: Kim I-O, editors. Radiology illustrated: pediatric radiology. Heidelberg: Springer Verlag; 2014. p. 629–63 (With permission from Springer Verlag)

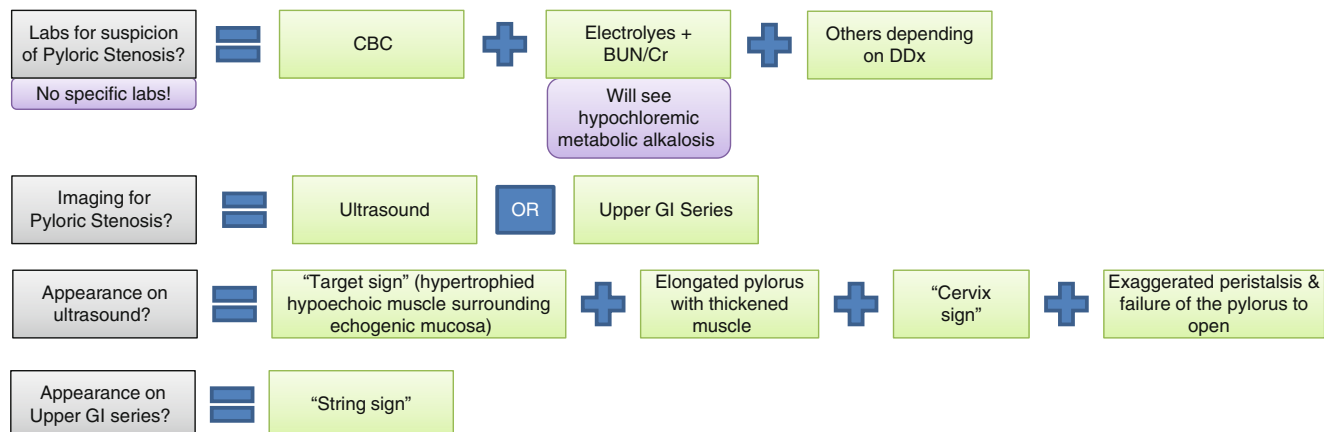
PEDIATRICS



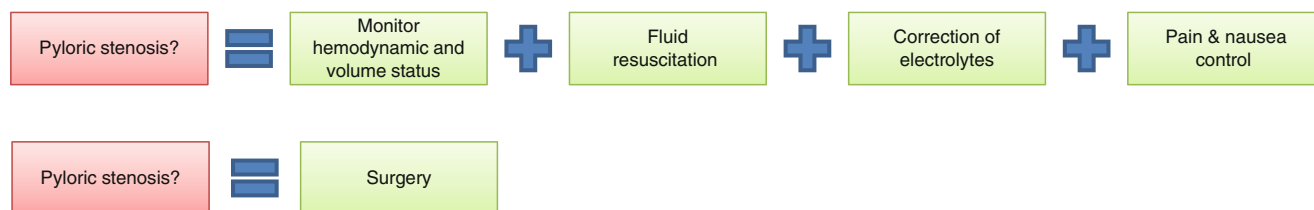
Symptoms & Signs



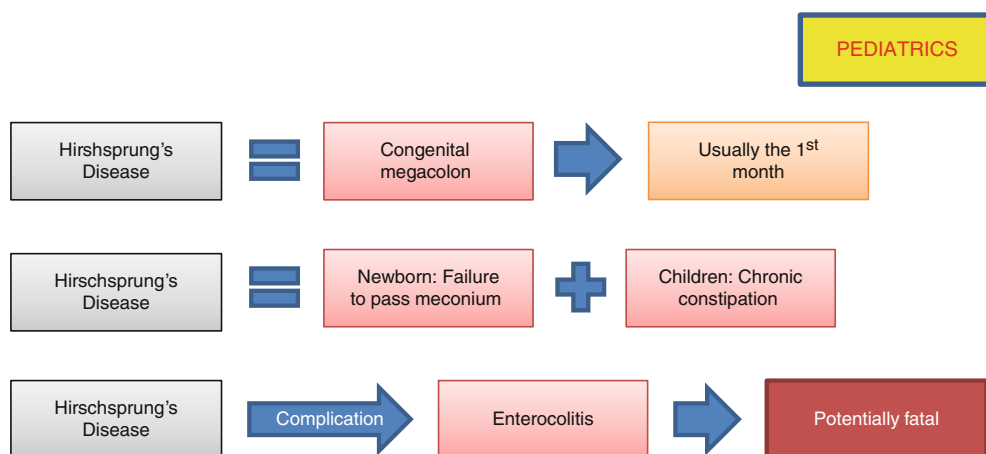
Diagnosis



Treatment



Hirschsprung's Disease

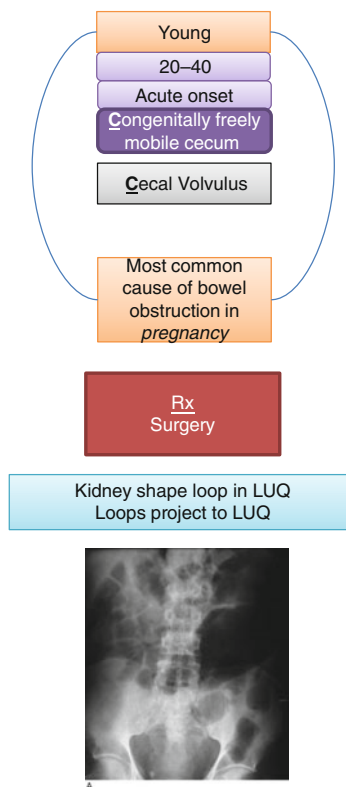
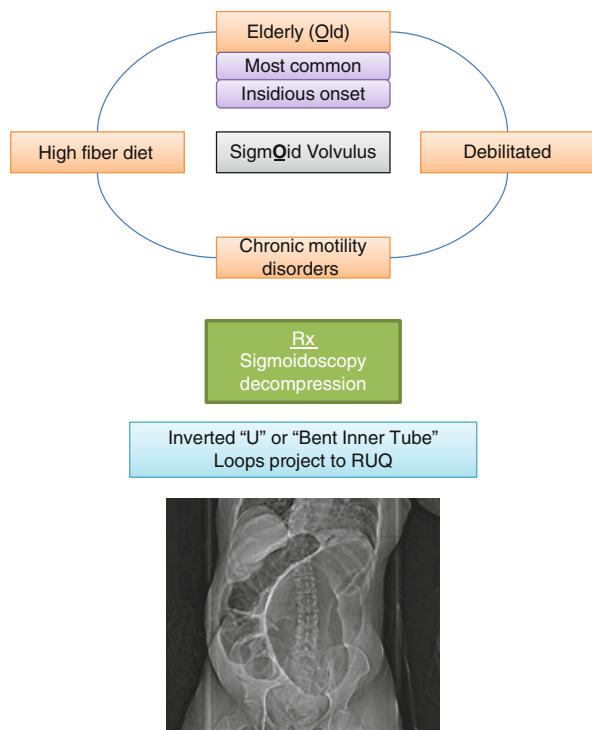


Volvulus

Introduction

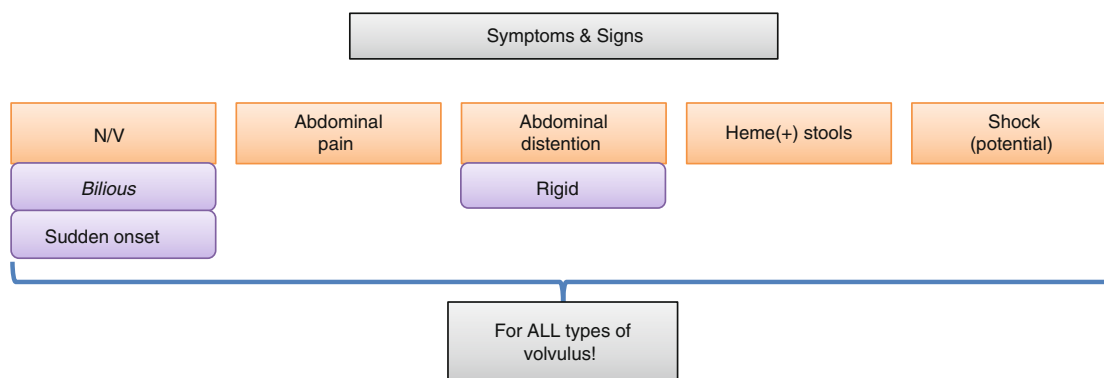
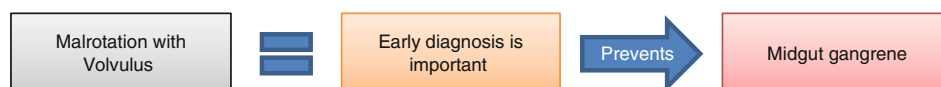
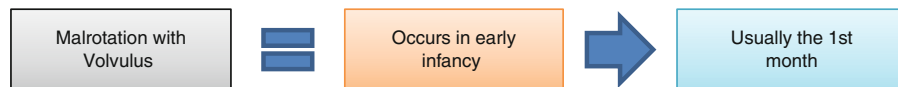
Bottom left image (Reprinted from Pelaez CA, Agarwal N. The surgical abdomen. In: Pitchumoni CS, Dharmarajan TS, editors. Geriatric gastroenterology. New York: Springer Science; 2012. p. 607–13. With permission from Springer Science + Business Media)

Bottom right image (Reprinted from Hellinger MD, Steinhagen RM. Colonic volvulus. In: Wolff BG, Fleshman JW, Beck DE, Pemberton JH, Wexner SD, Church JM, Garcia-Aguilar J, Roberts PL, Saclarides TJ, Stamos MJ, editors. The ASCRS textbook of colon and rectal surgery. New York: Springer Science; 2007. p. 286–98. With permission from Springer Science + Business Media)

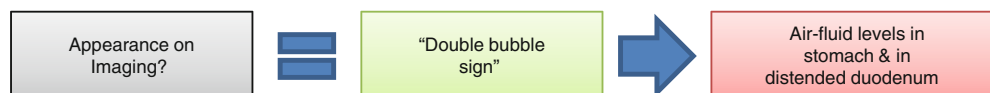


Malrotation with Volvulus

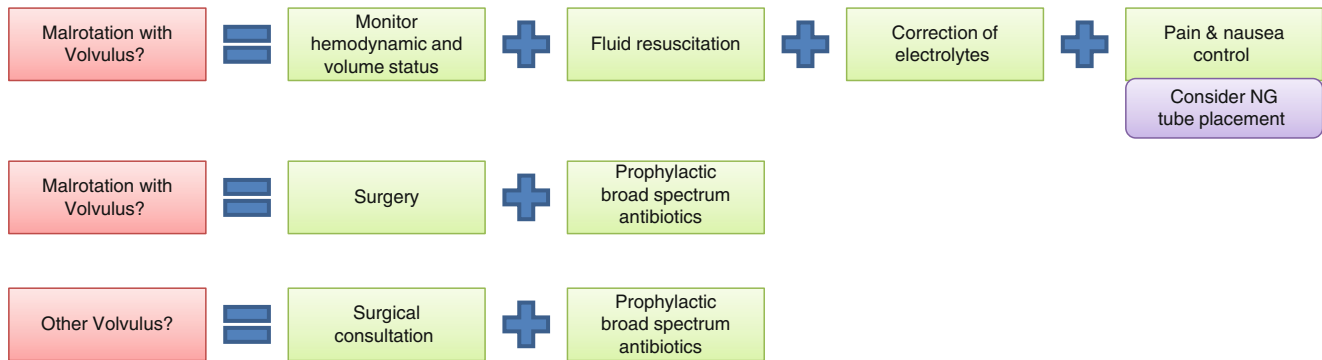
PEDIATRICS



Diagnosis

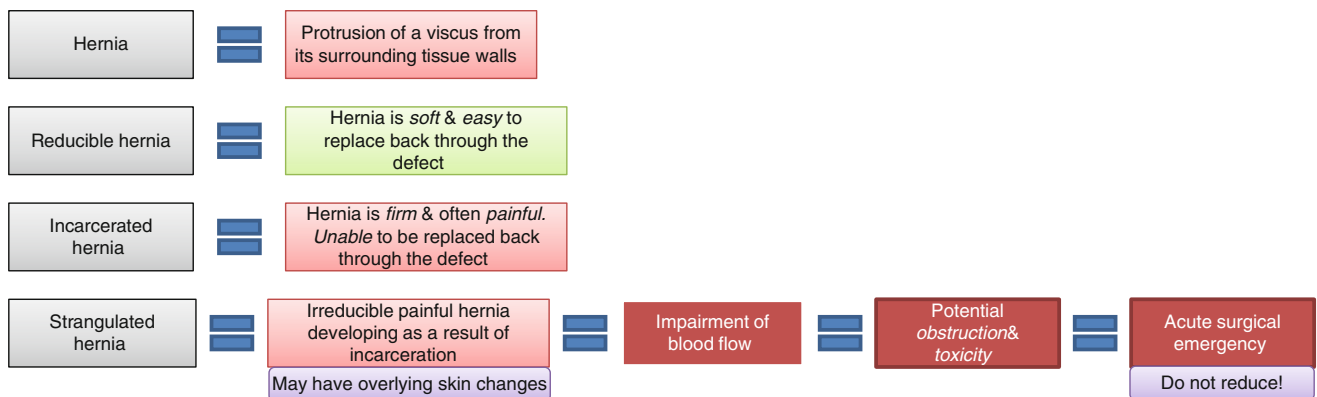


Treatment

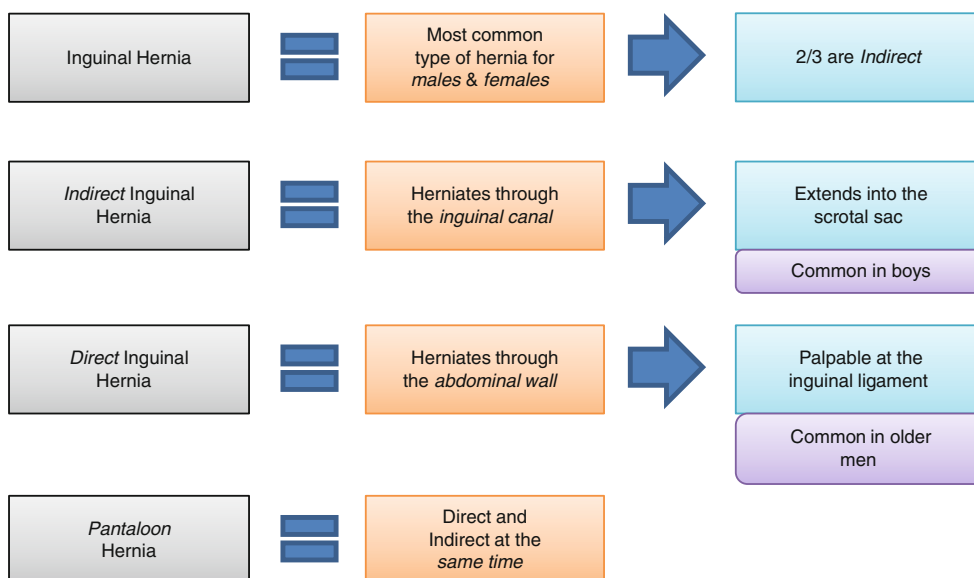


Hernias

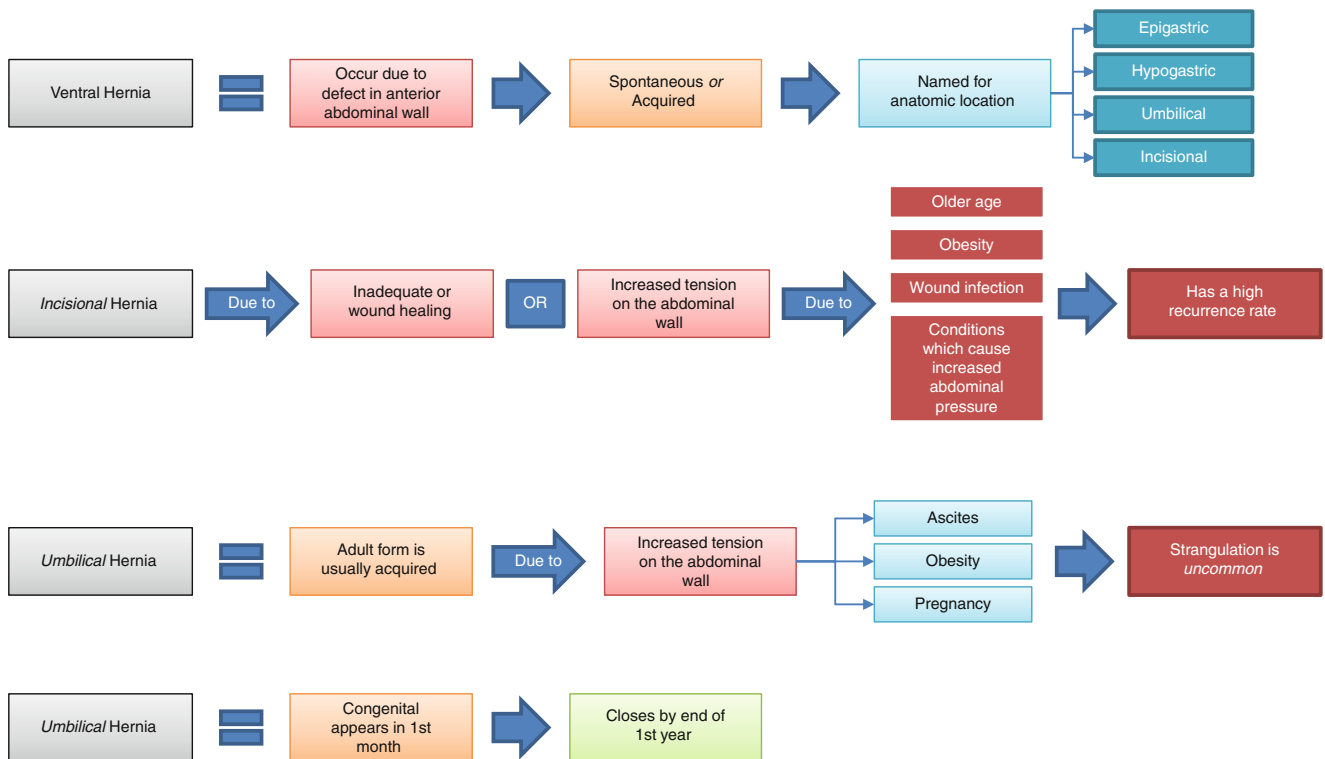
Introduction



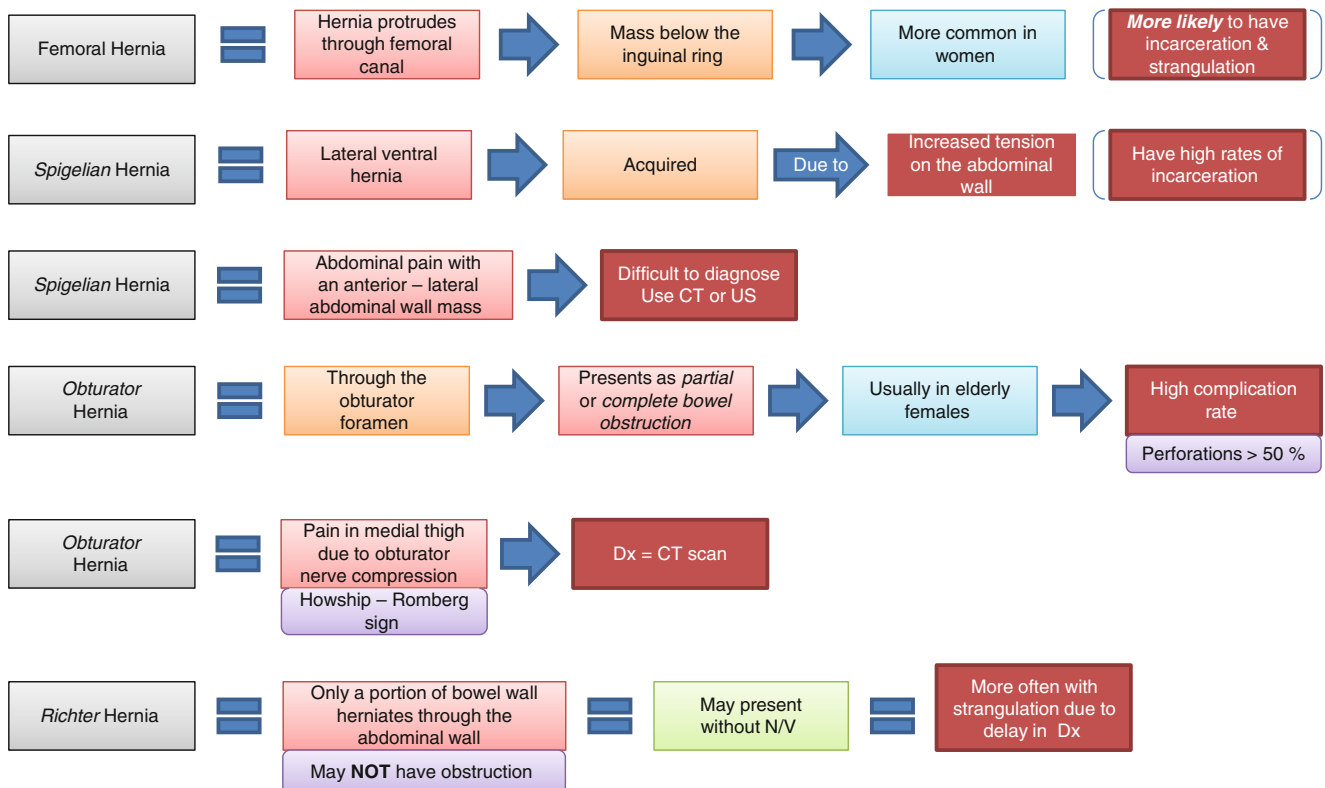
Inguinal Hernias



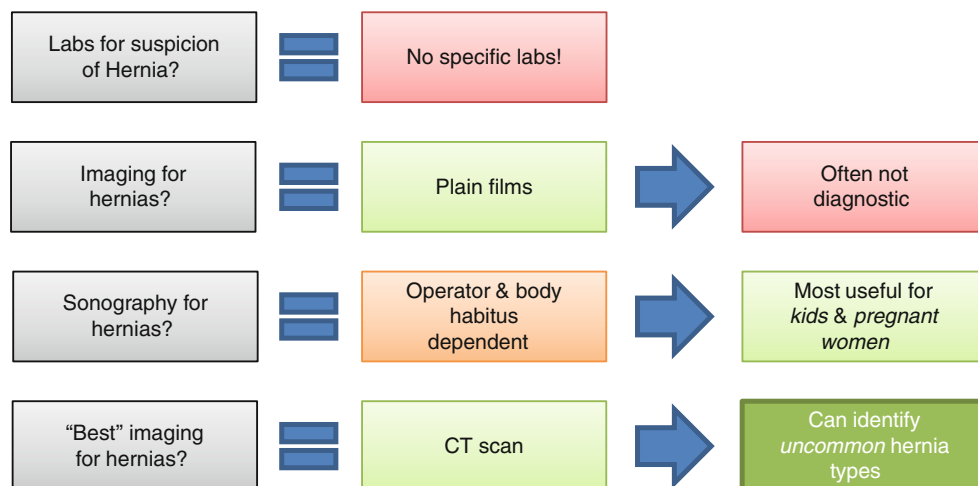
Ventral Hernias



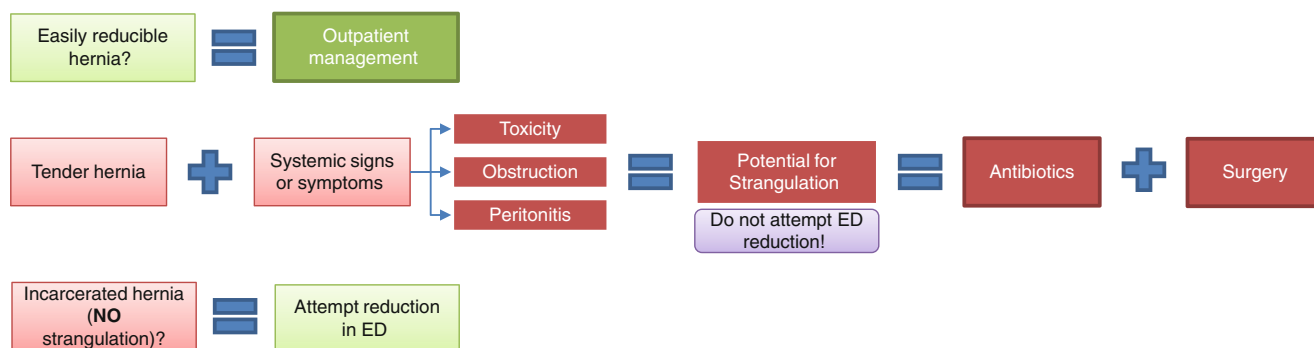
Other Hernias



Diagnosis

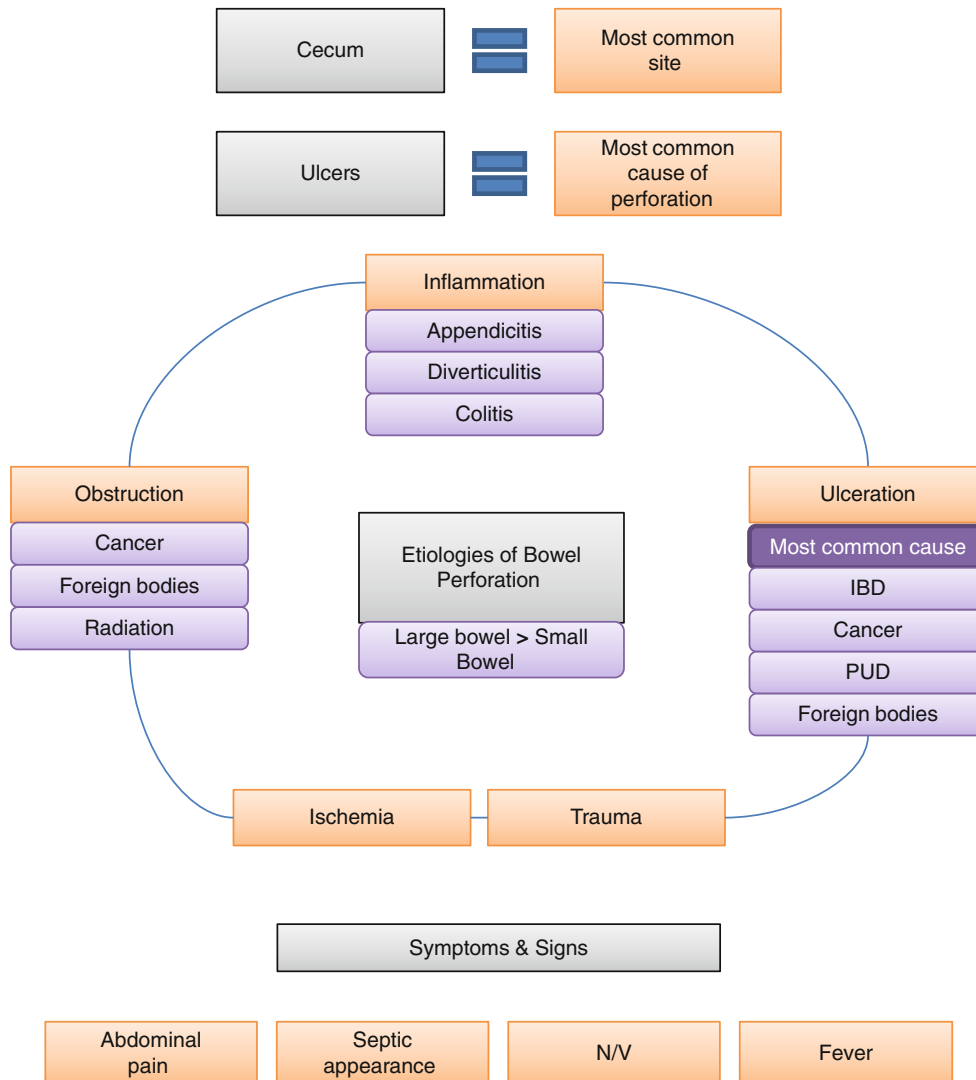


Treatment

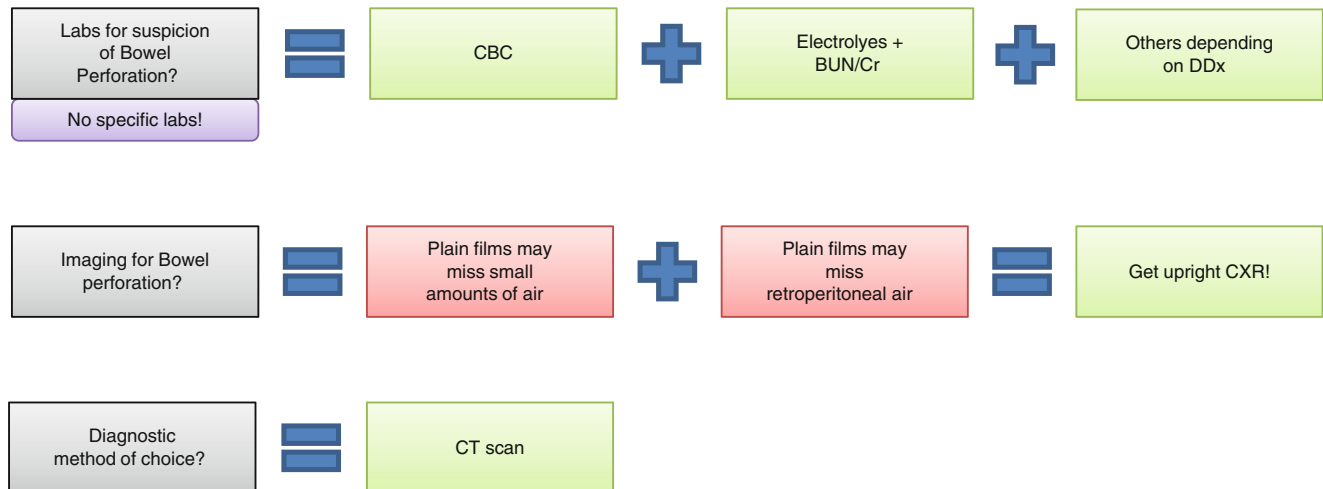


Bowel Perforation

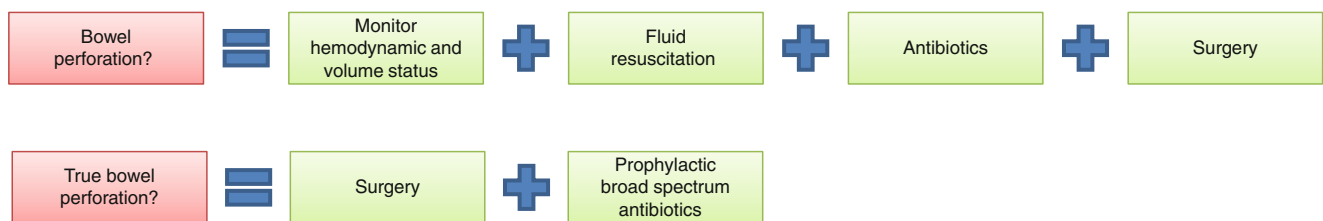
Introduction



Diagnosis

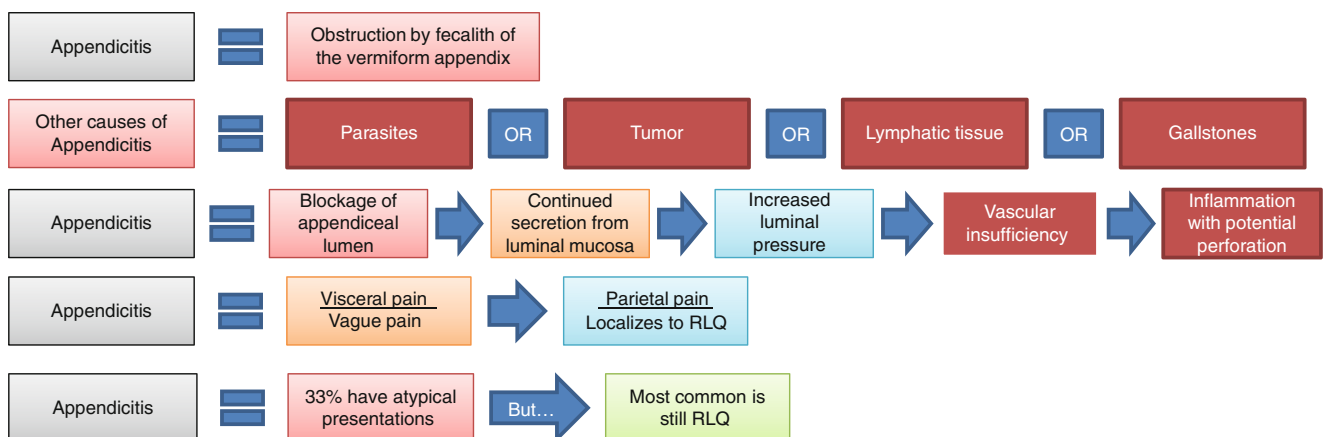


Treatment

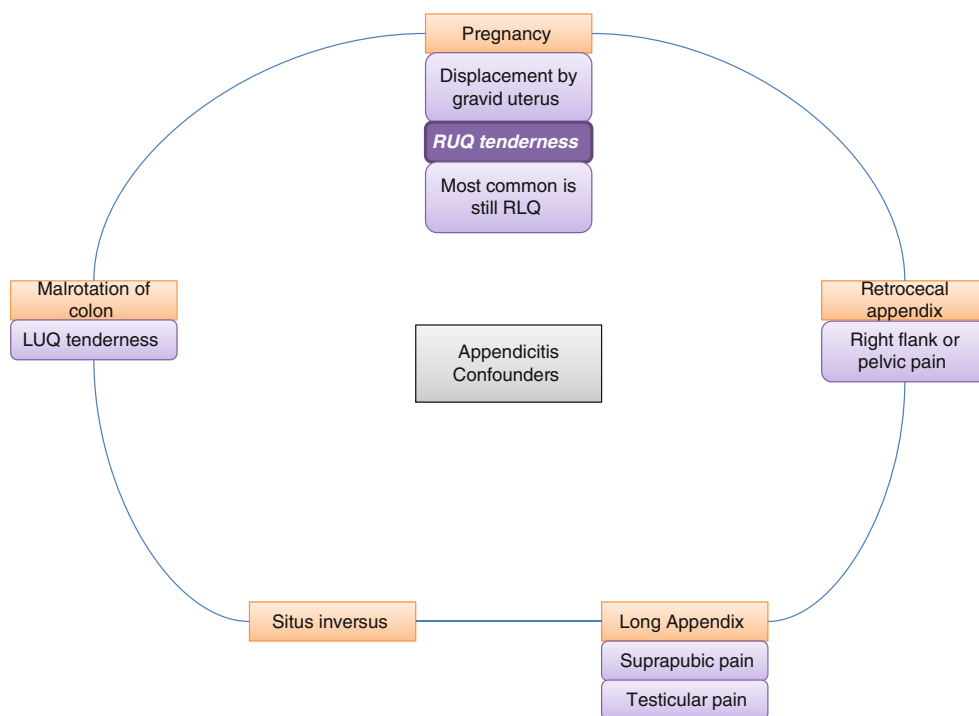


Acute Appendicitis

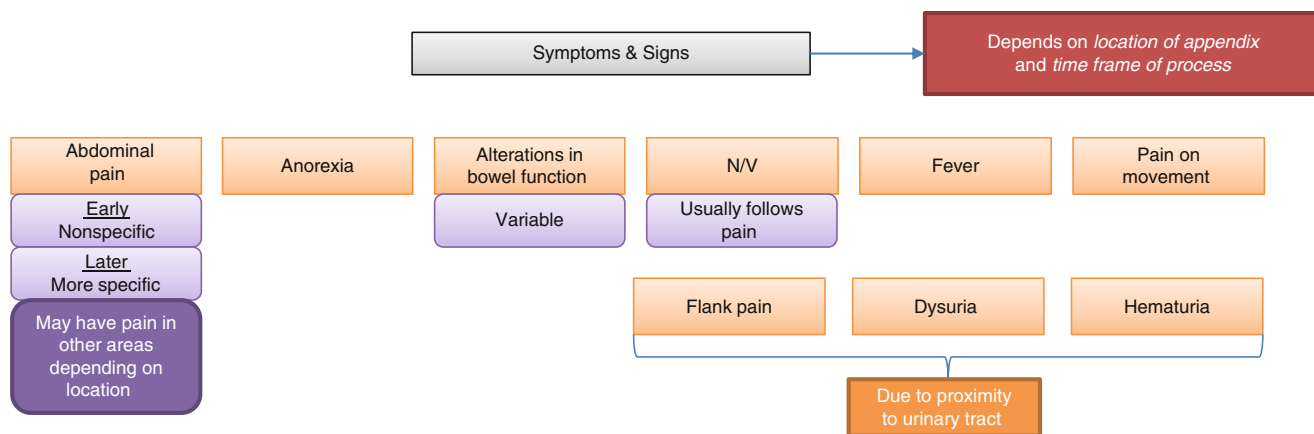
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Appendicitis Confounders

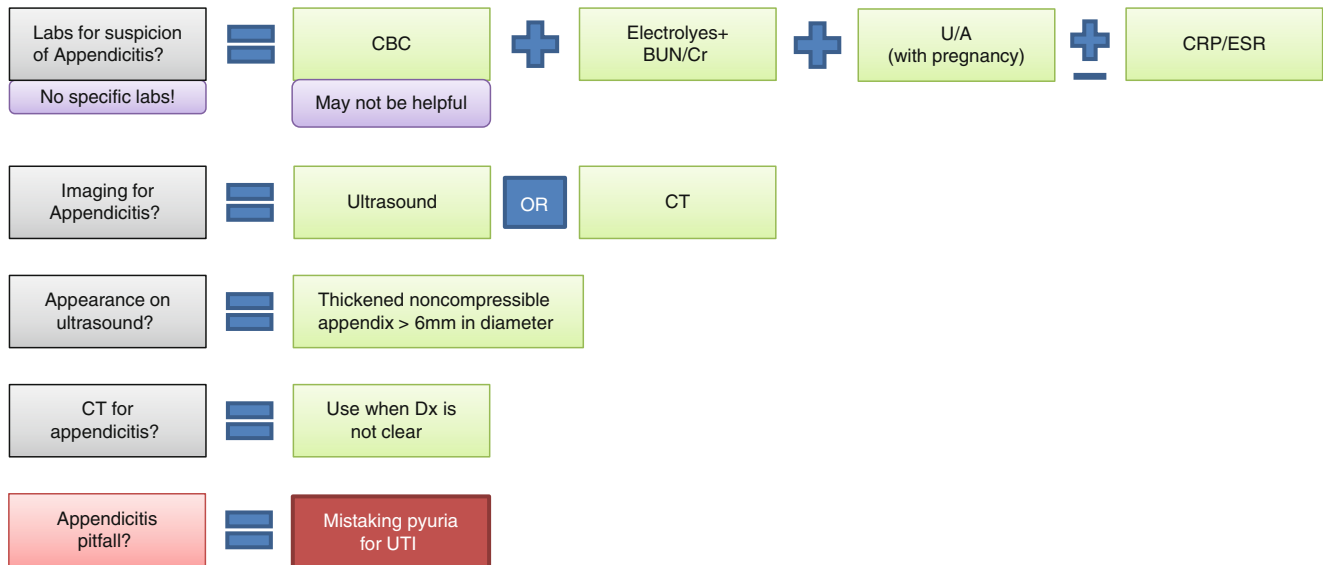


Symptoms and Signs

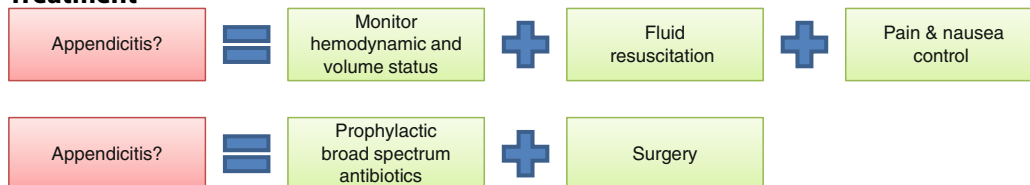


Sudden improvement in pain?	==	Consider perforation
Rovsing's sign	==	Palpation of LLQ worsens RLQ pain
Psoas sign	==	RLQ pain with thigh extension while patient is in left lateral decubitus
Obturator sign	==	RLQ pain with internal and external rotation of hip

Diagnosis

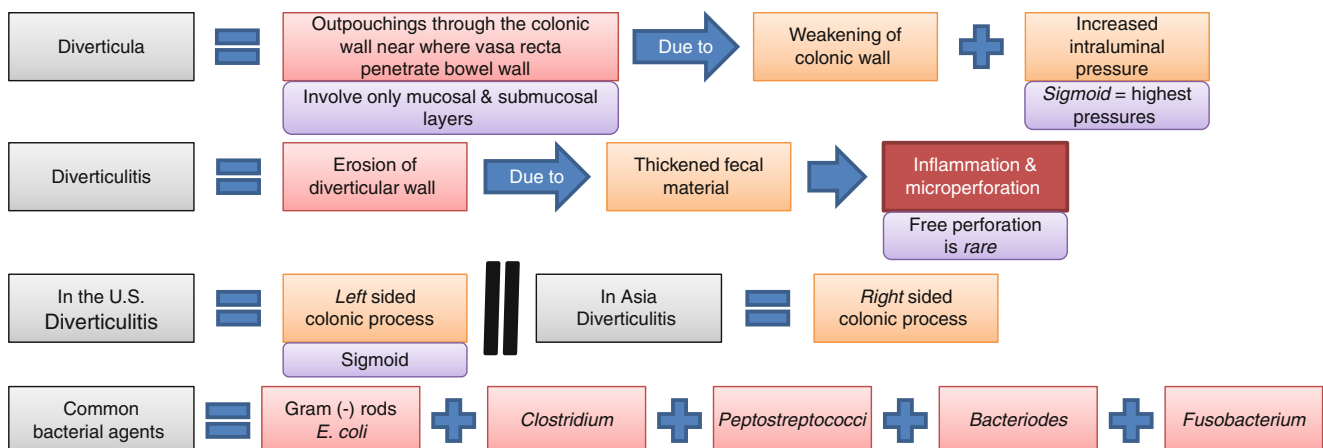


Treatment

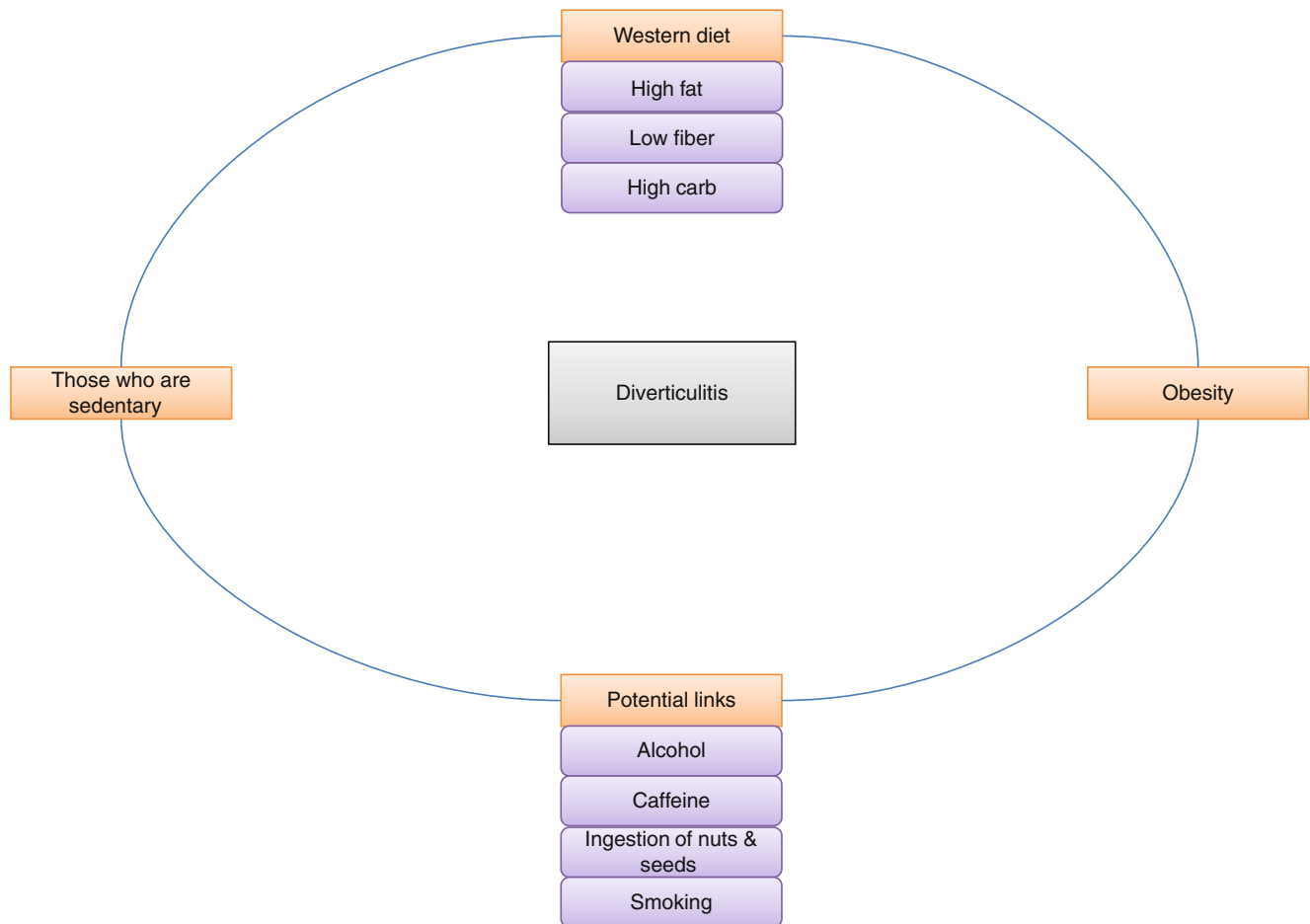


Acute Diverticulitis

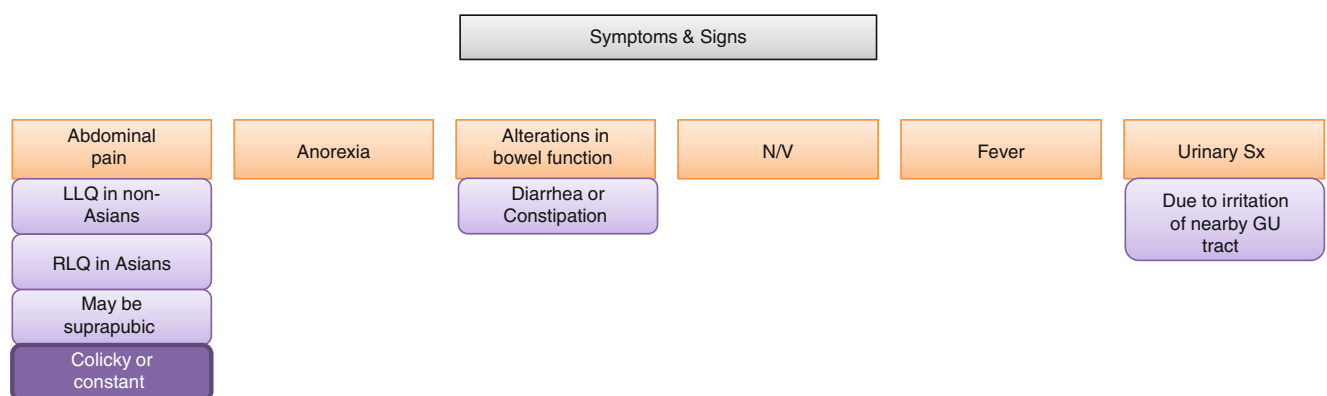
Introduction: Diverticulitis



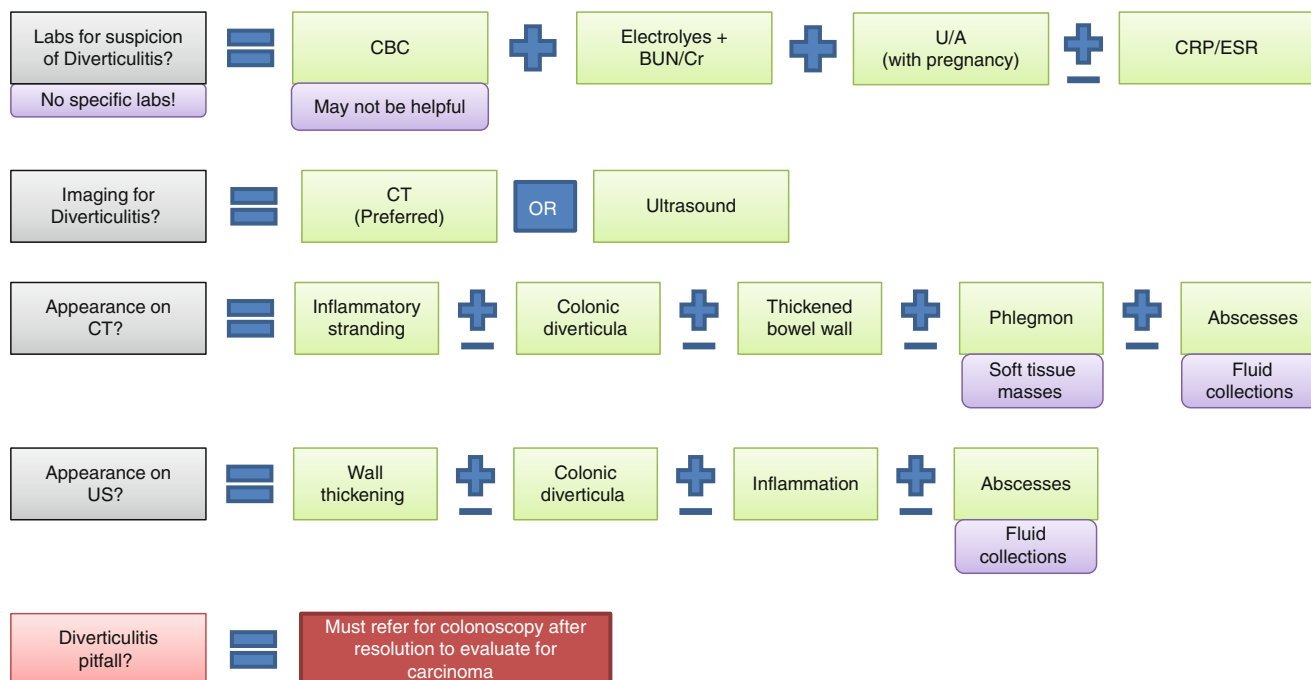
Risk Factors for Diverticulitis



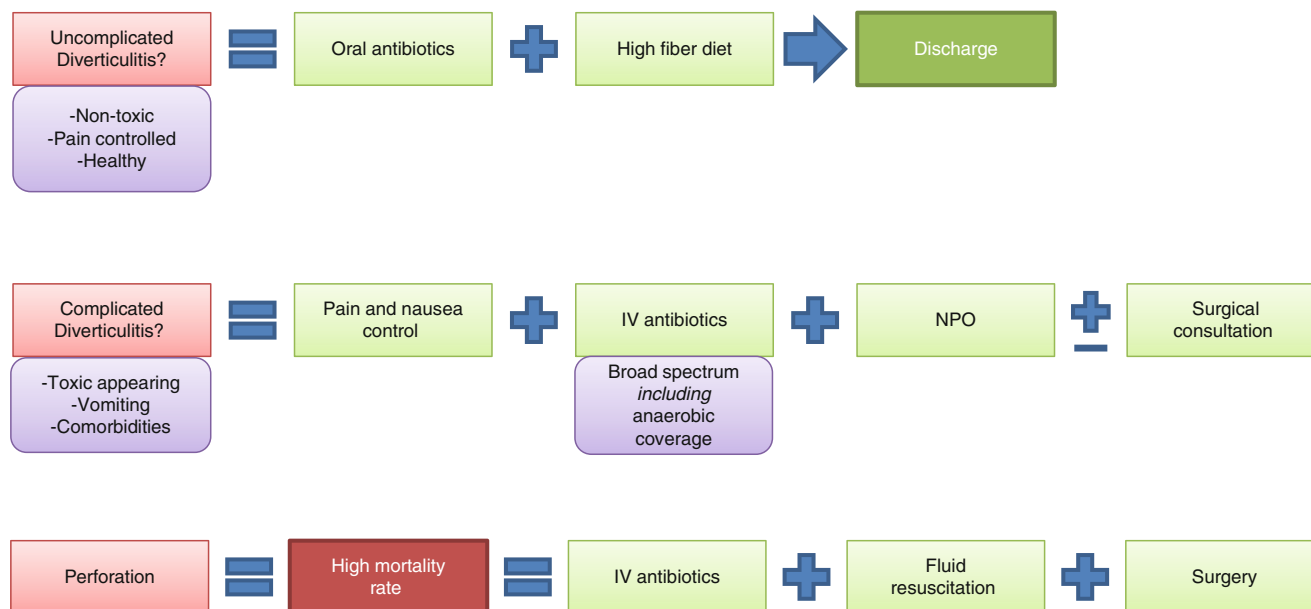
Symptoms and Signs



Diagnosis

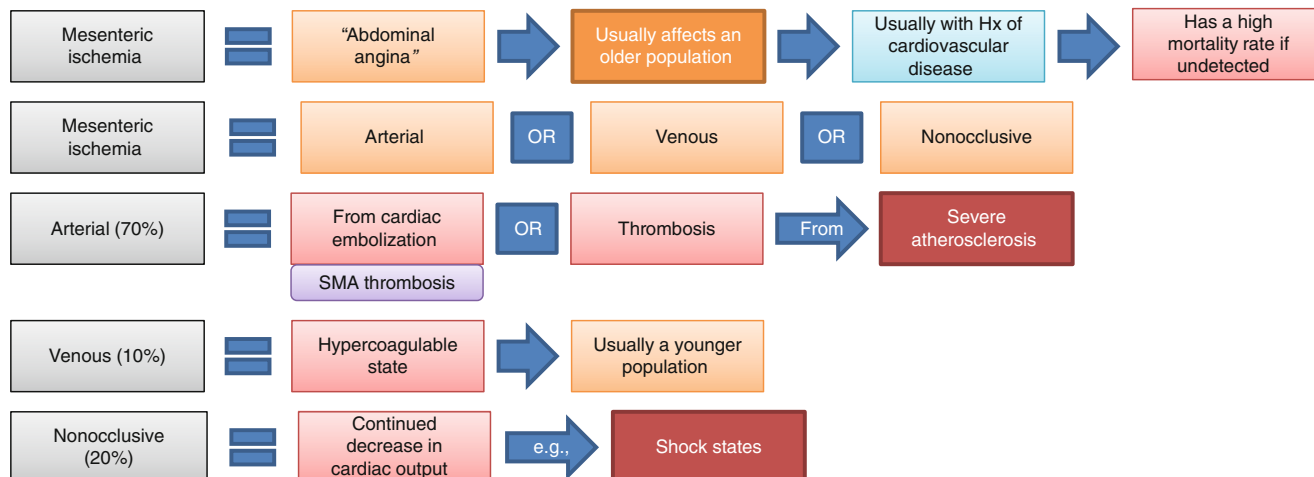


Treatment

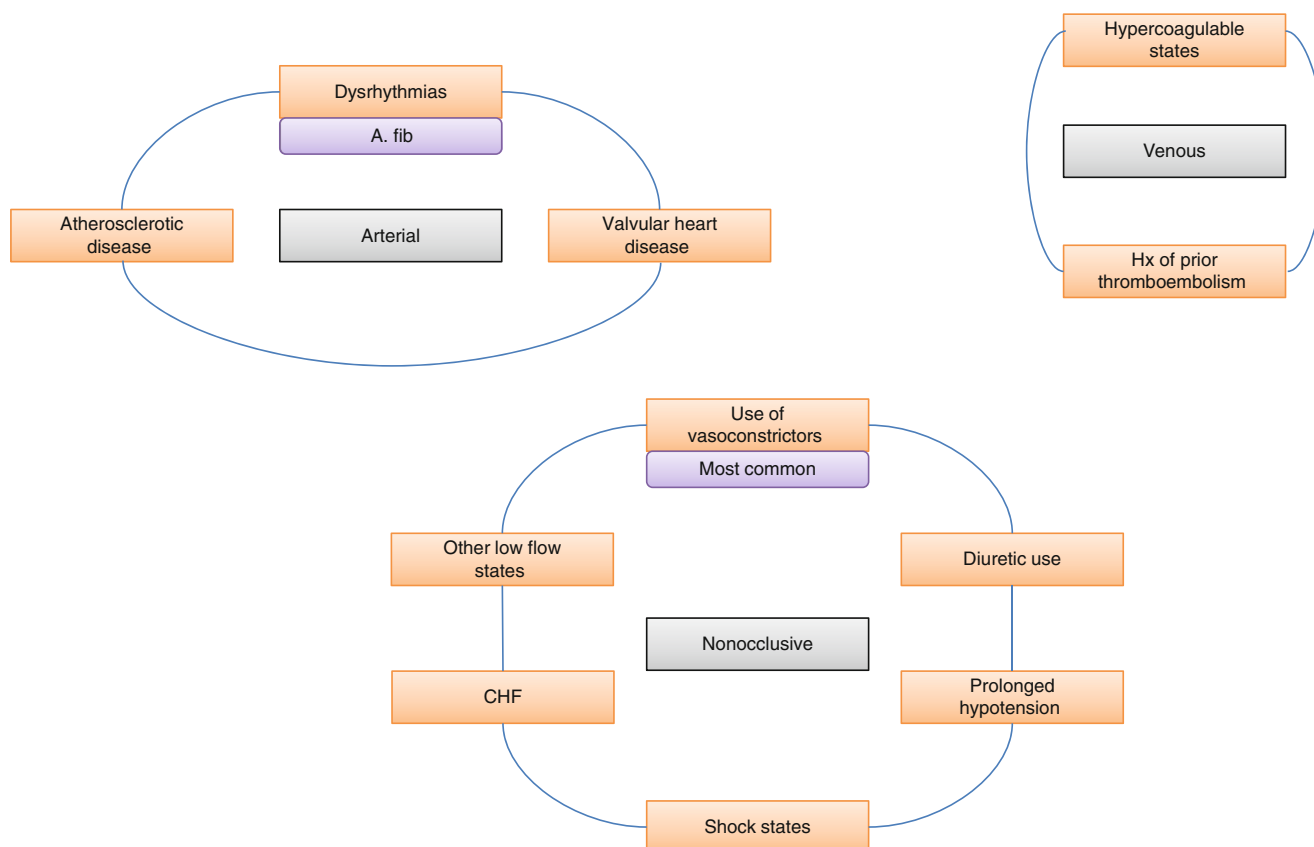


Mesenteric Ischemia

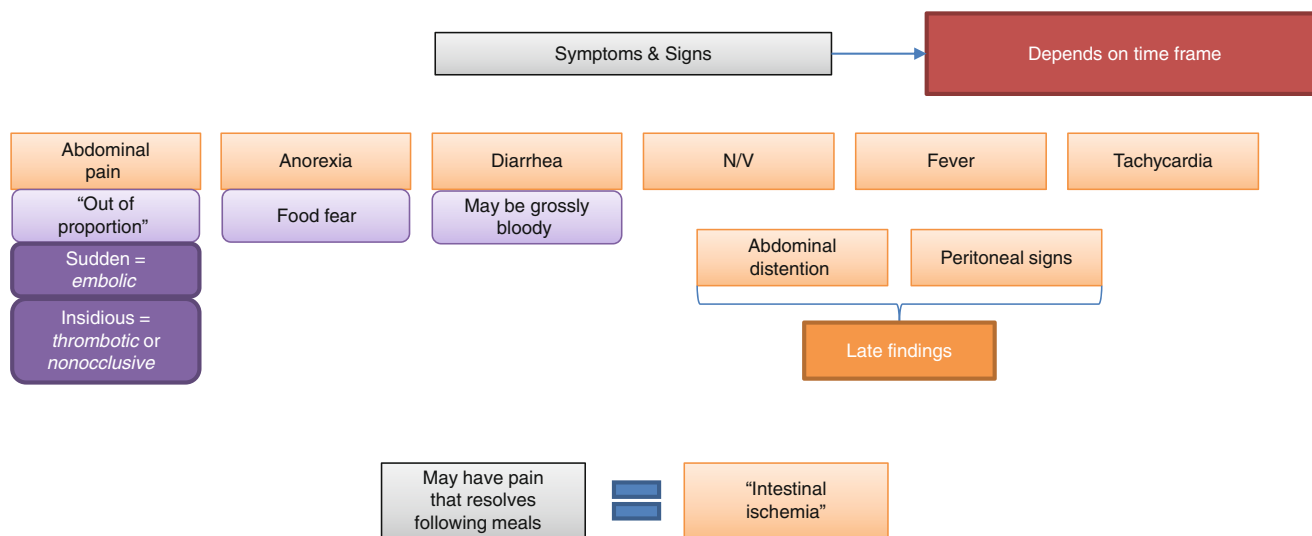
Introduction



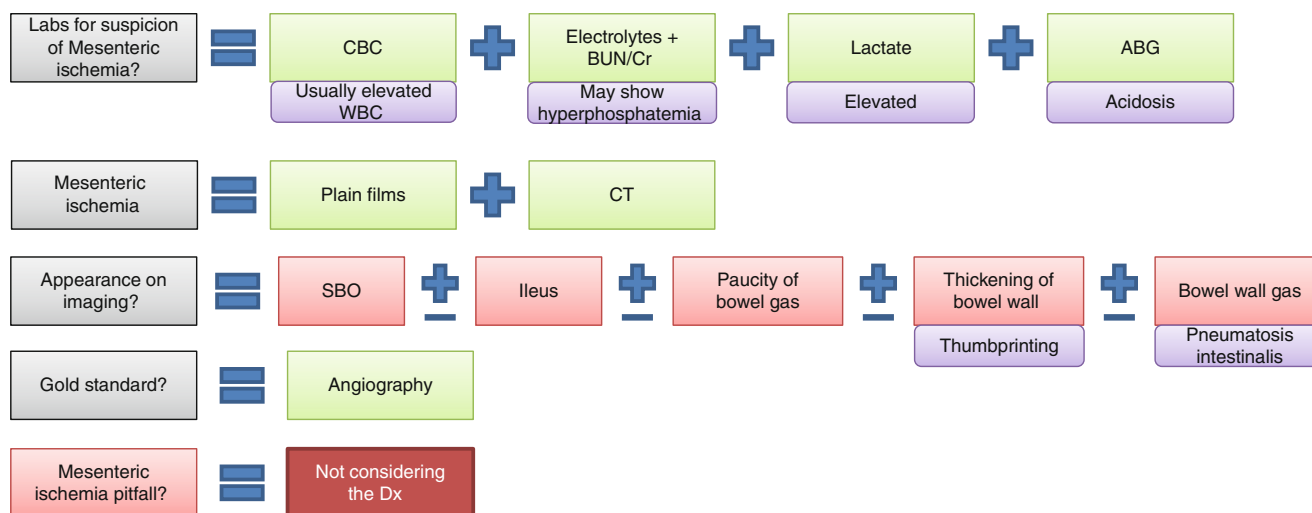
Risk Factors for Mesenteric Ischemia



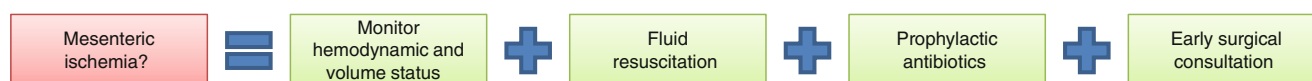
Symptoms and Signs



Diagnosis

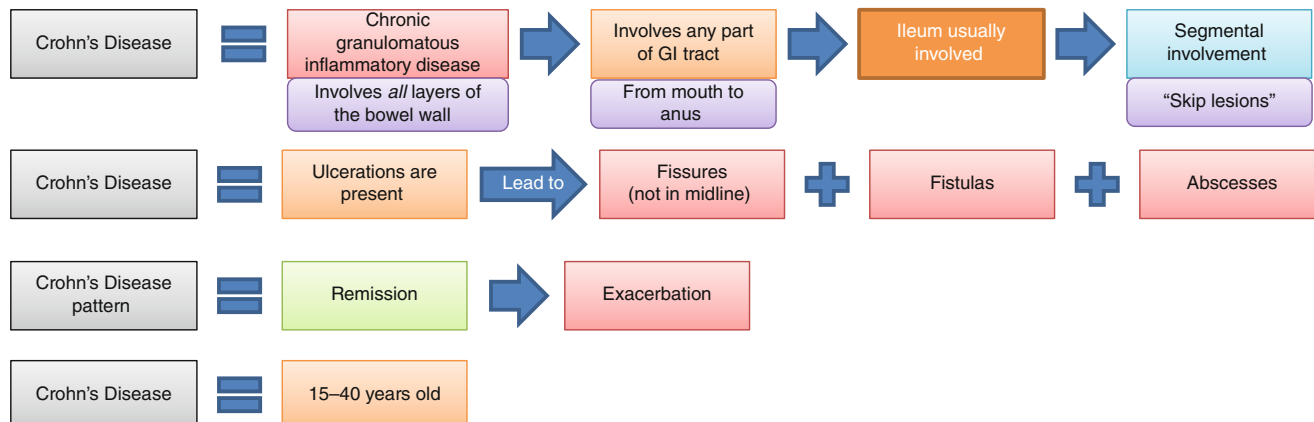


Treatment

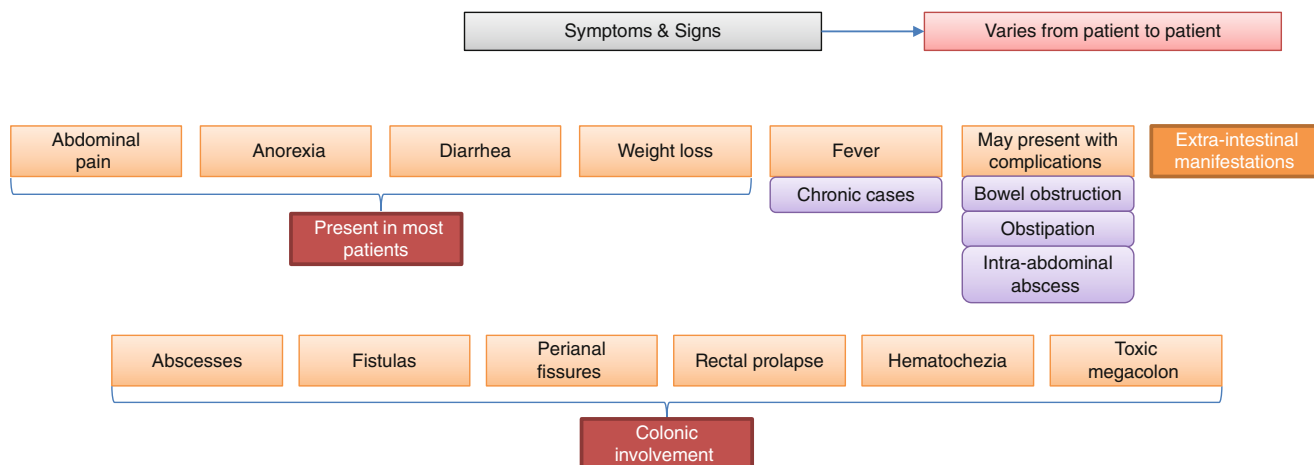


Crohn's Disease

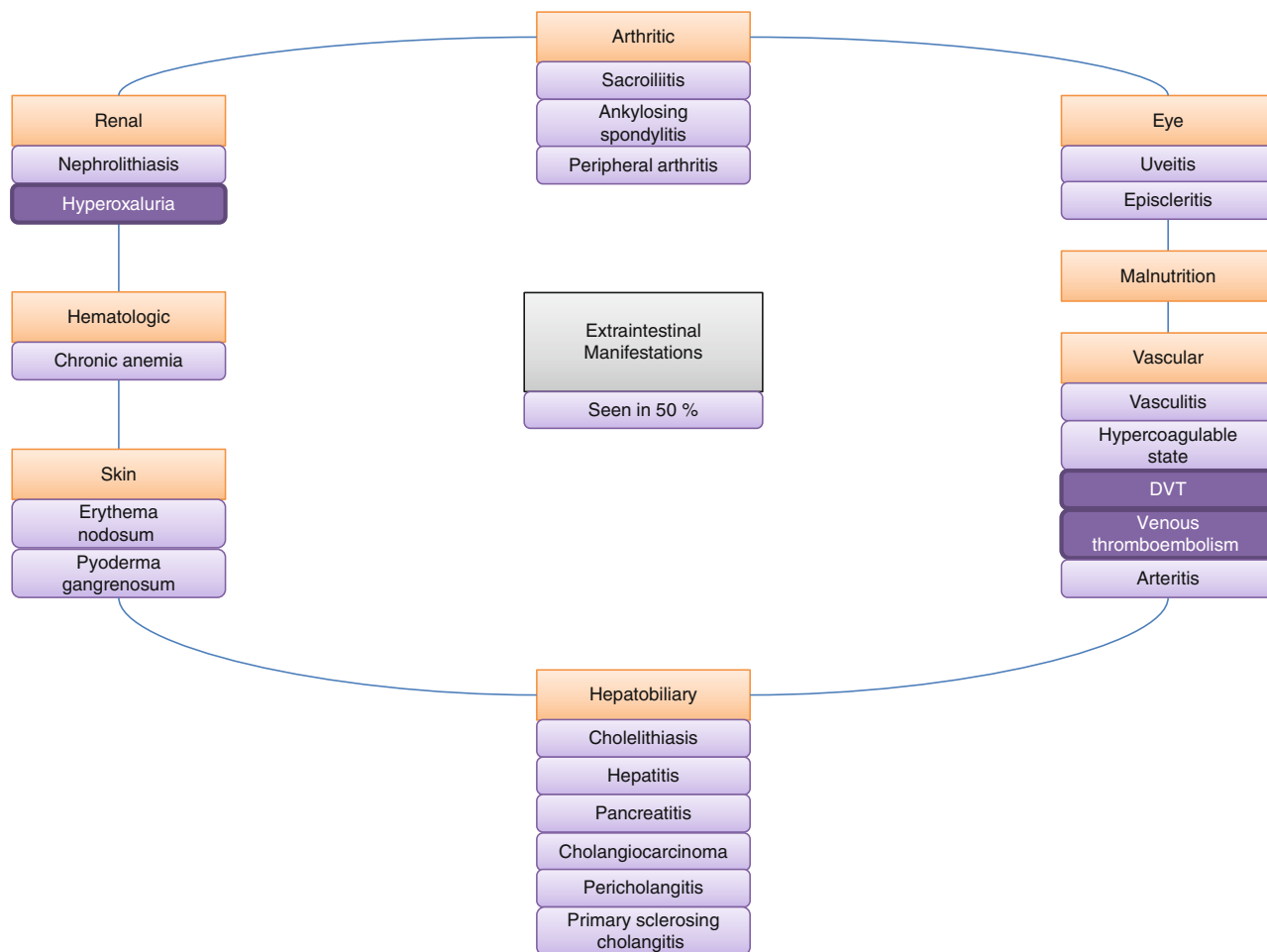
Introduction



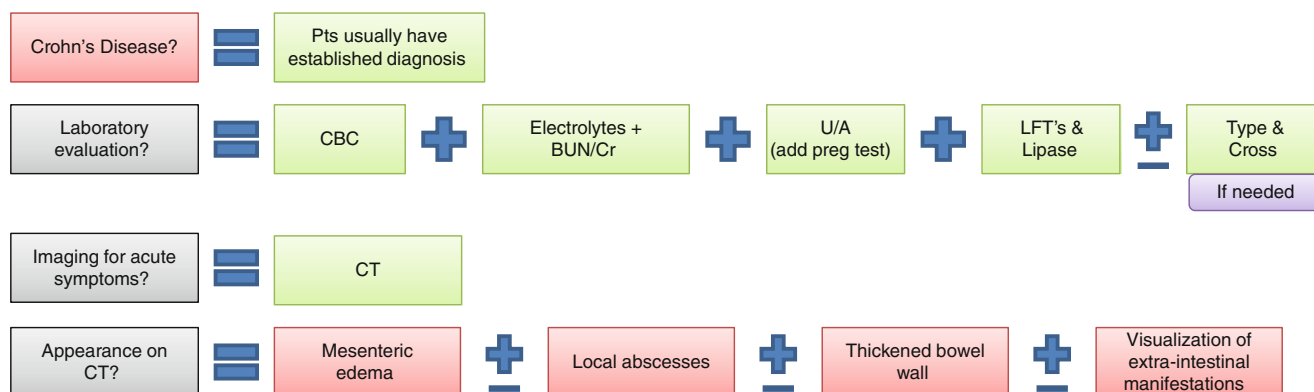
Symptoms and Signs

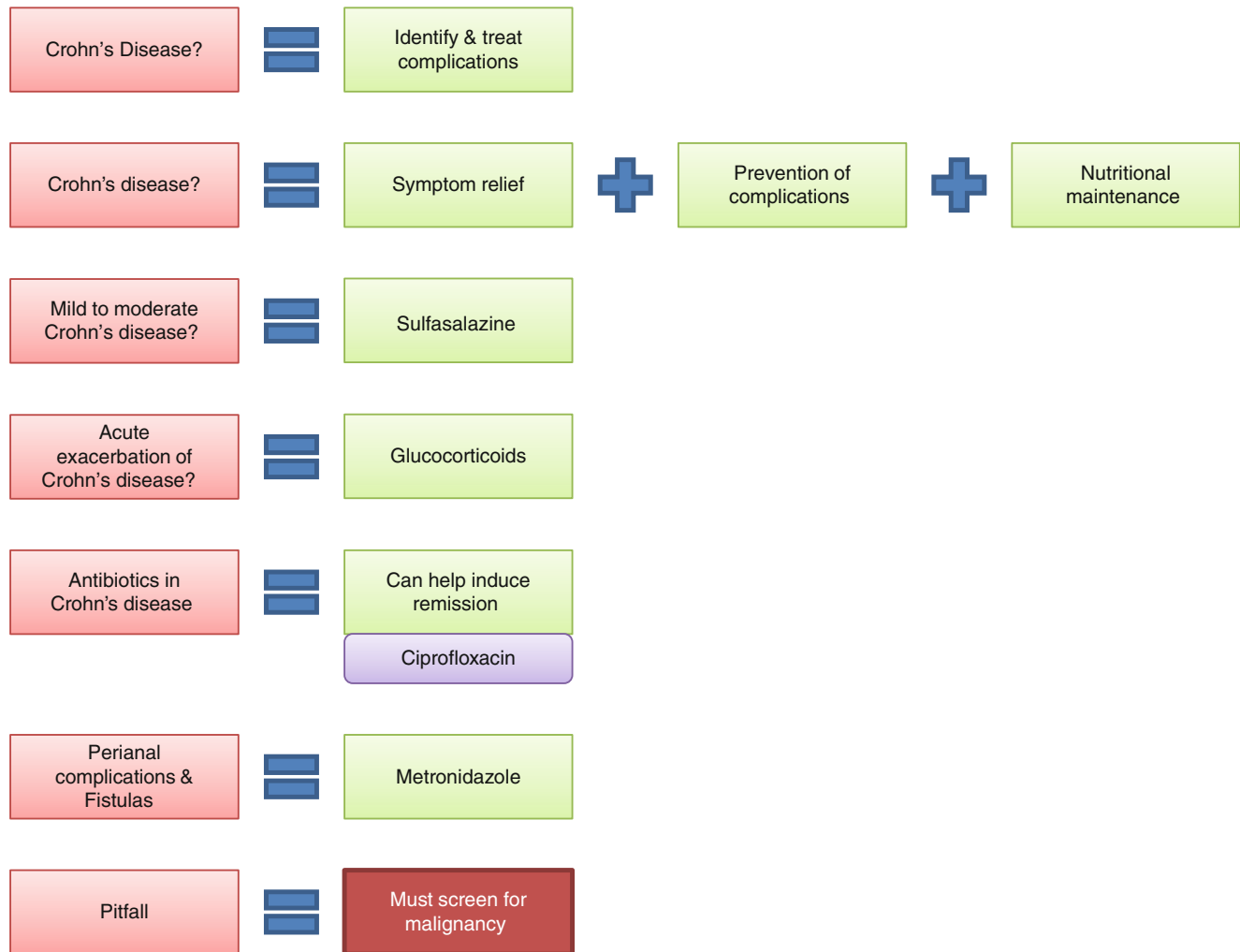


Extraintestinal Manifestations



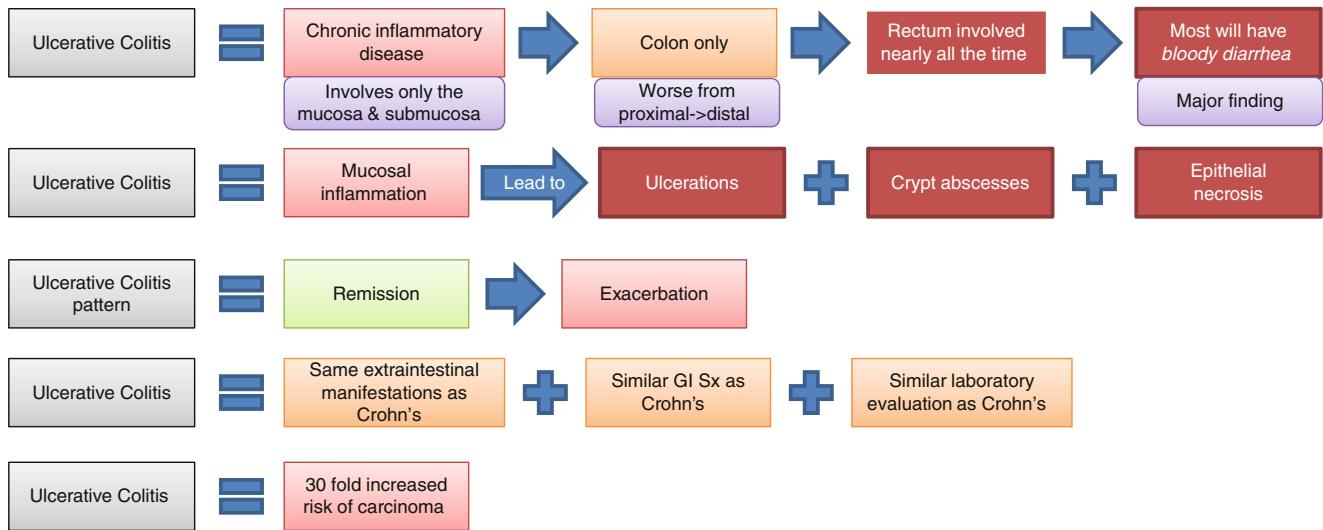
Diagnosis



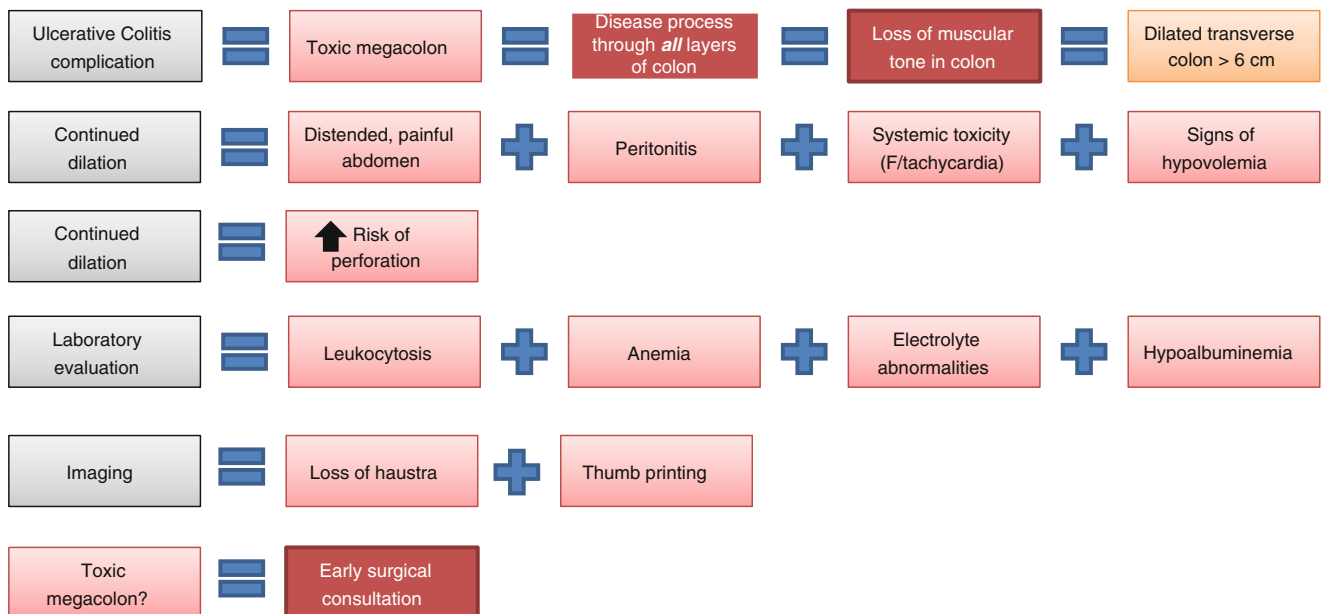
Treatment

Ulcerative Colitis

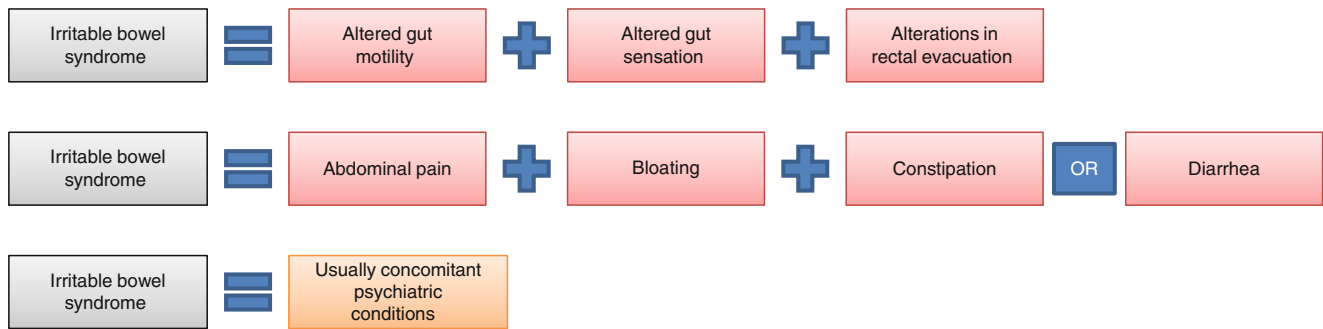
Introduction



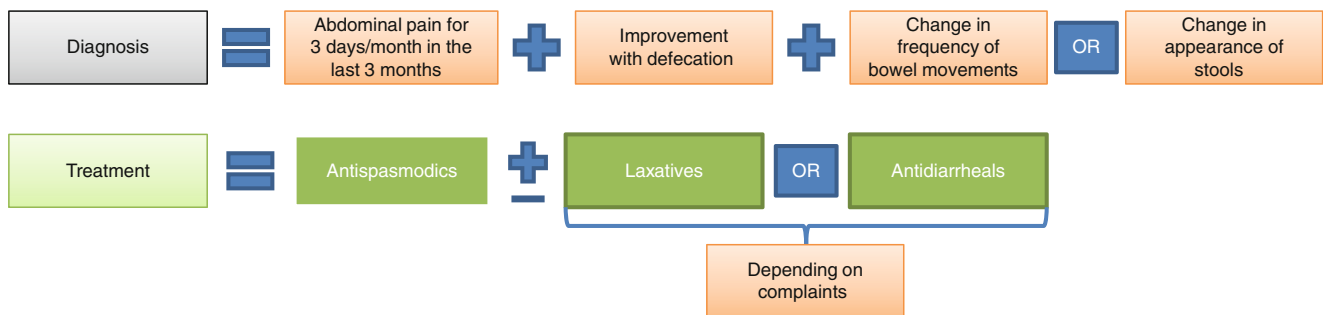
Toxic Megacolon



Irritable Bowel Syndrome

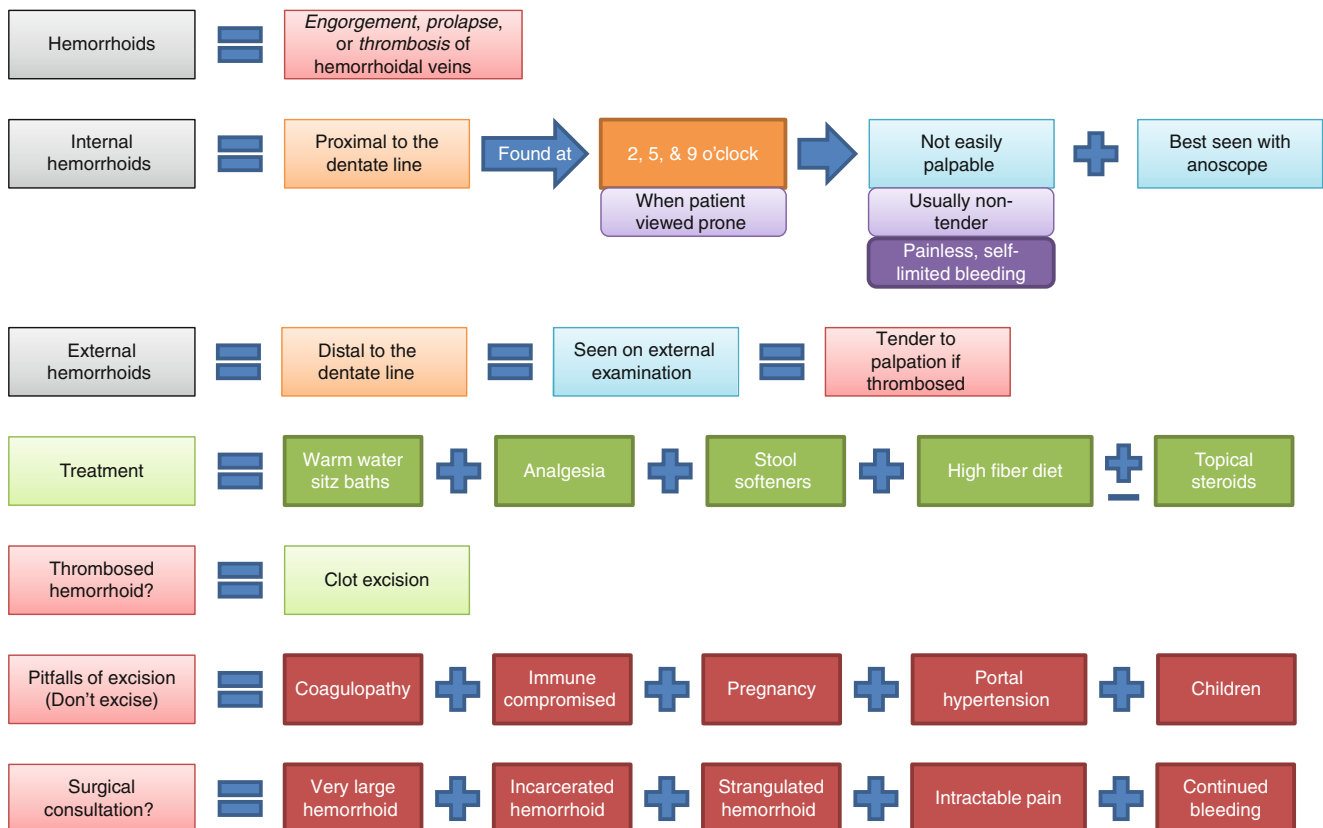


Diagnosis and Treatment

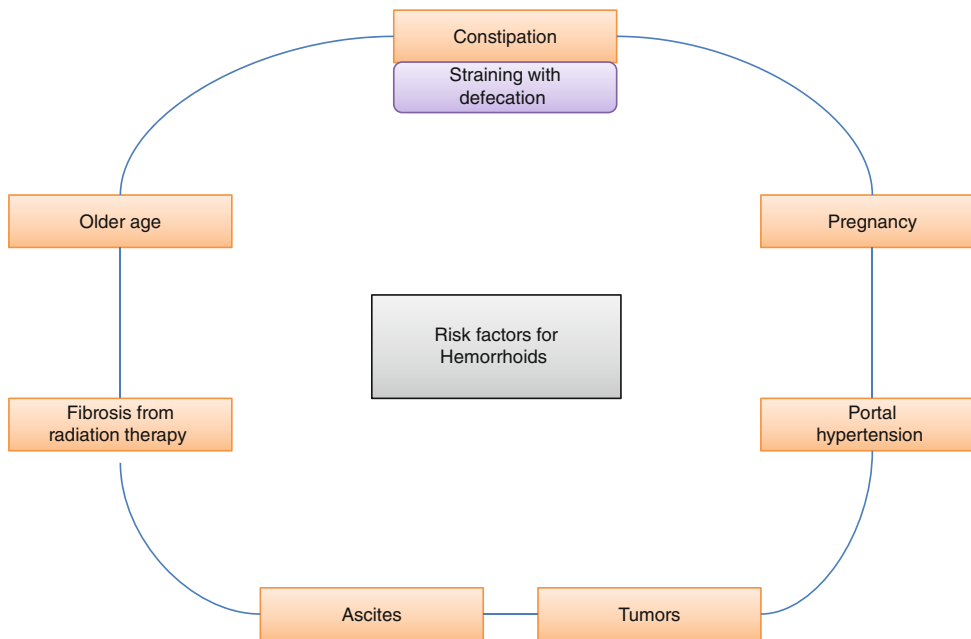


Miscellaneous Anorectal Emergencies

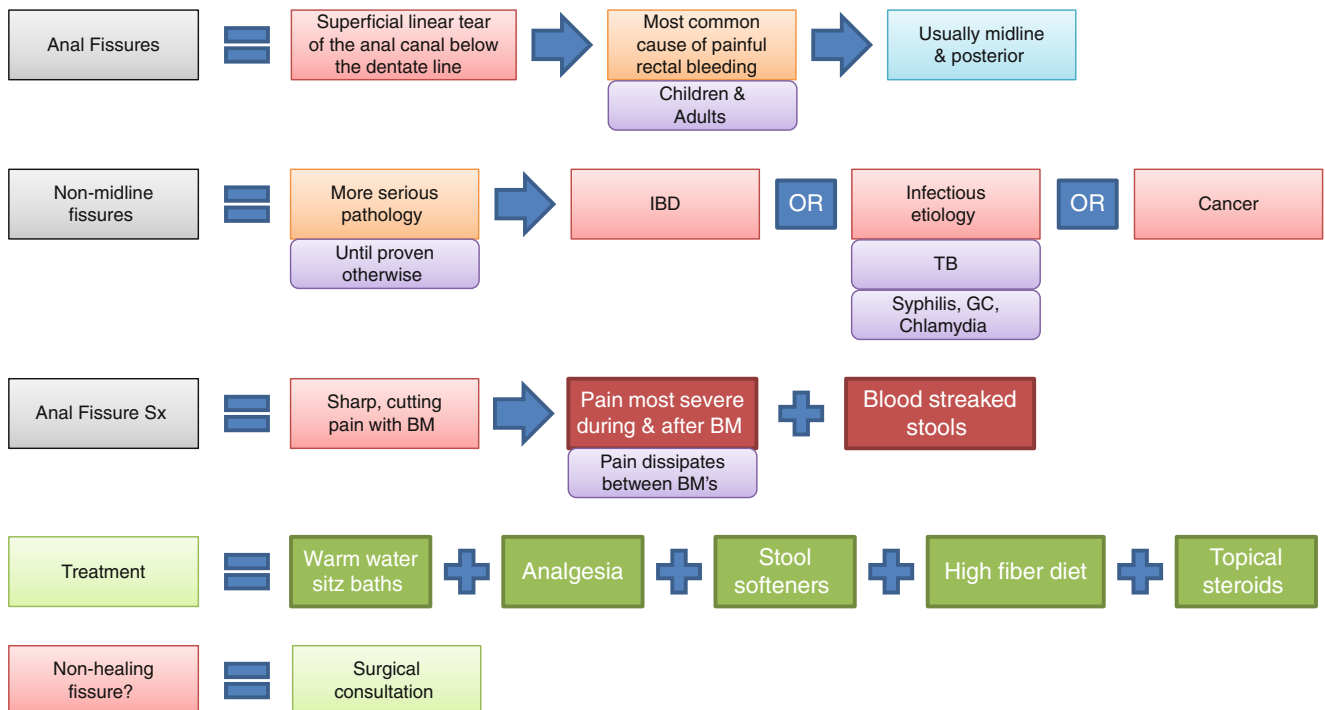
Hemorrhoids



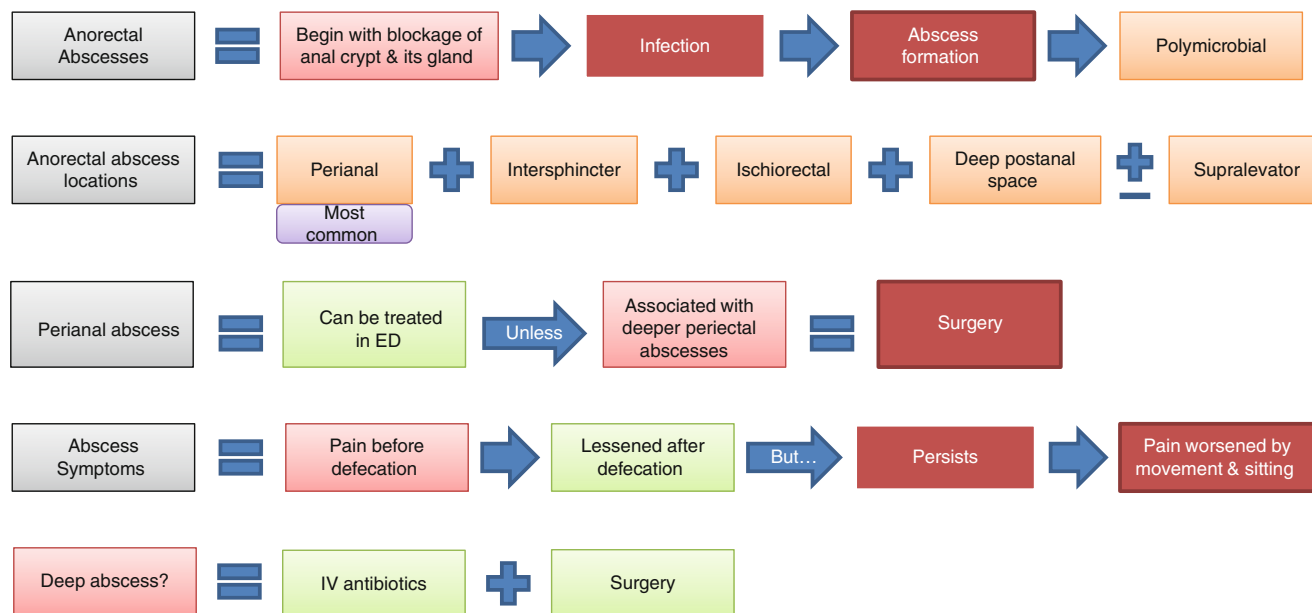
Risk Factors for Hemorrhoids



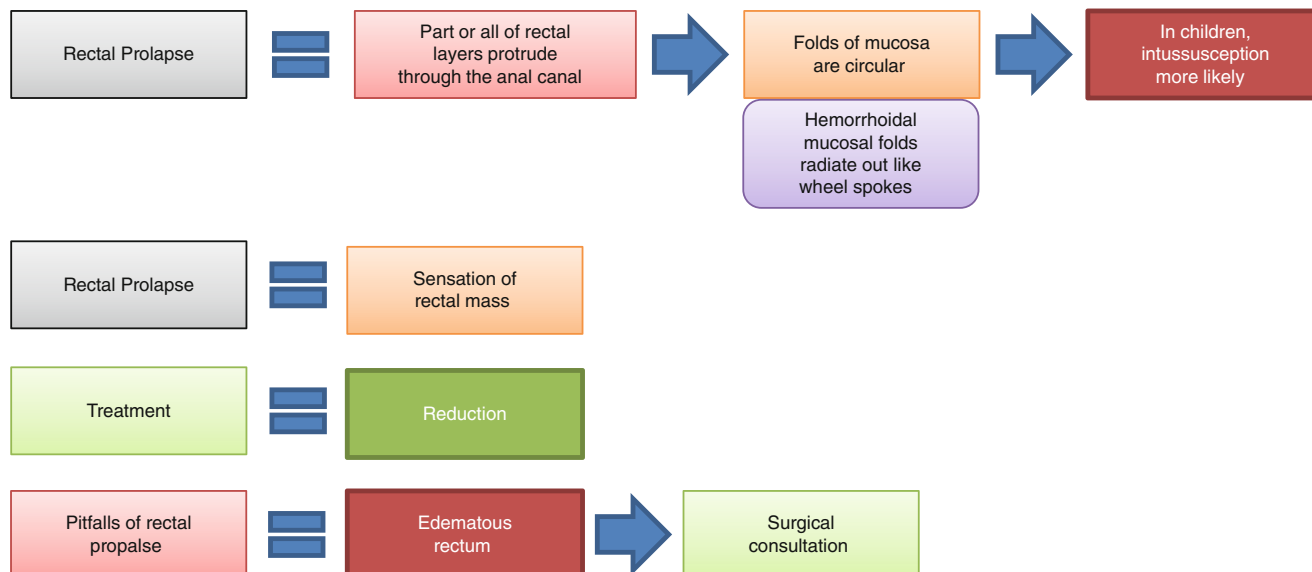
Anal Fissures



Anorectal Abscesses



Rectal Prolapse



Nephrology and Urology

Bobby Desai

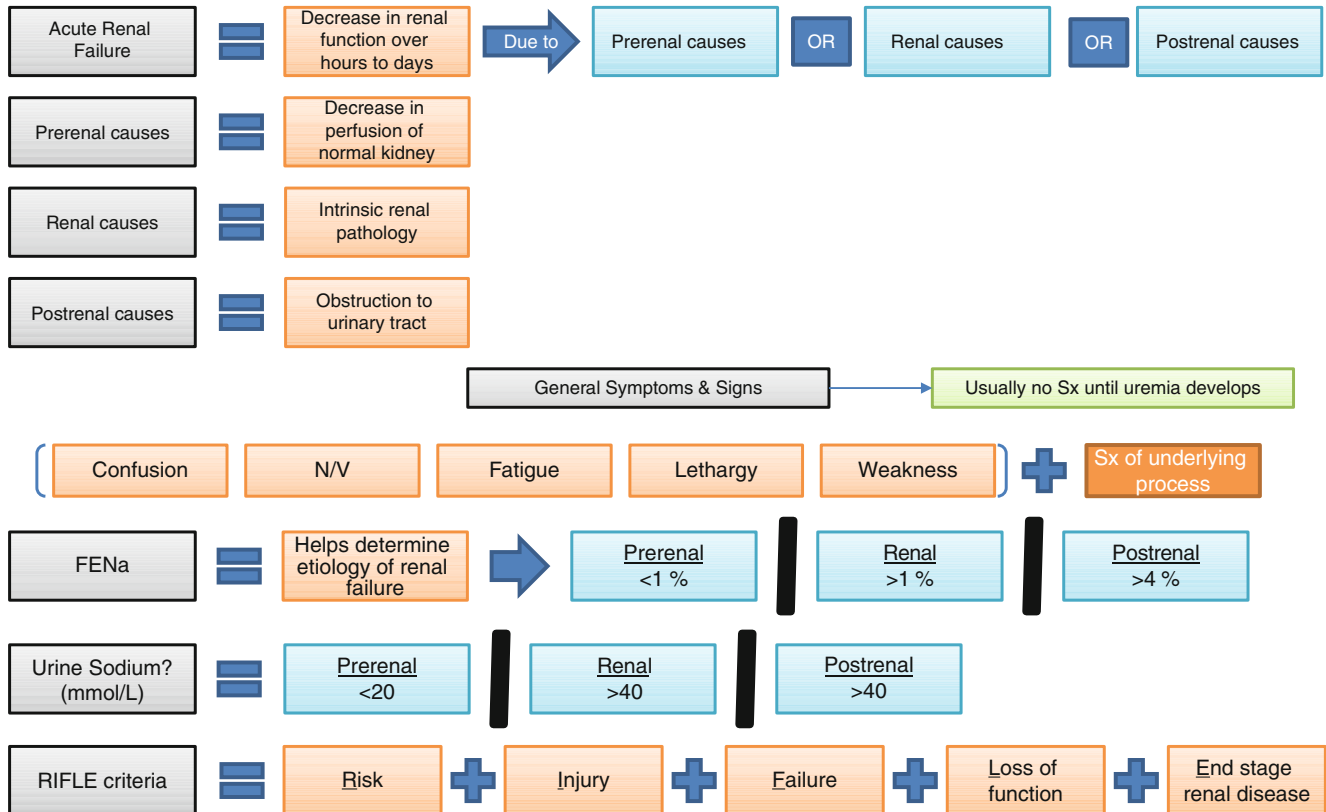
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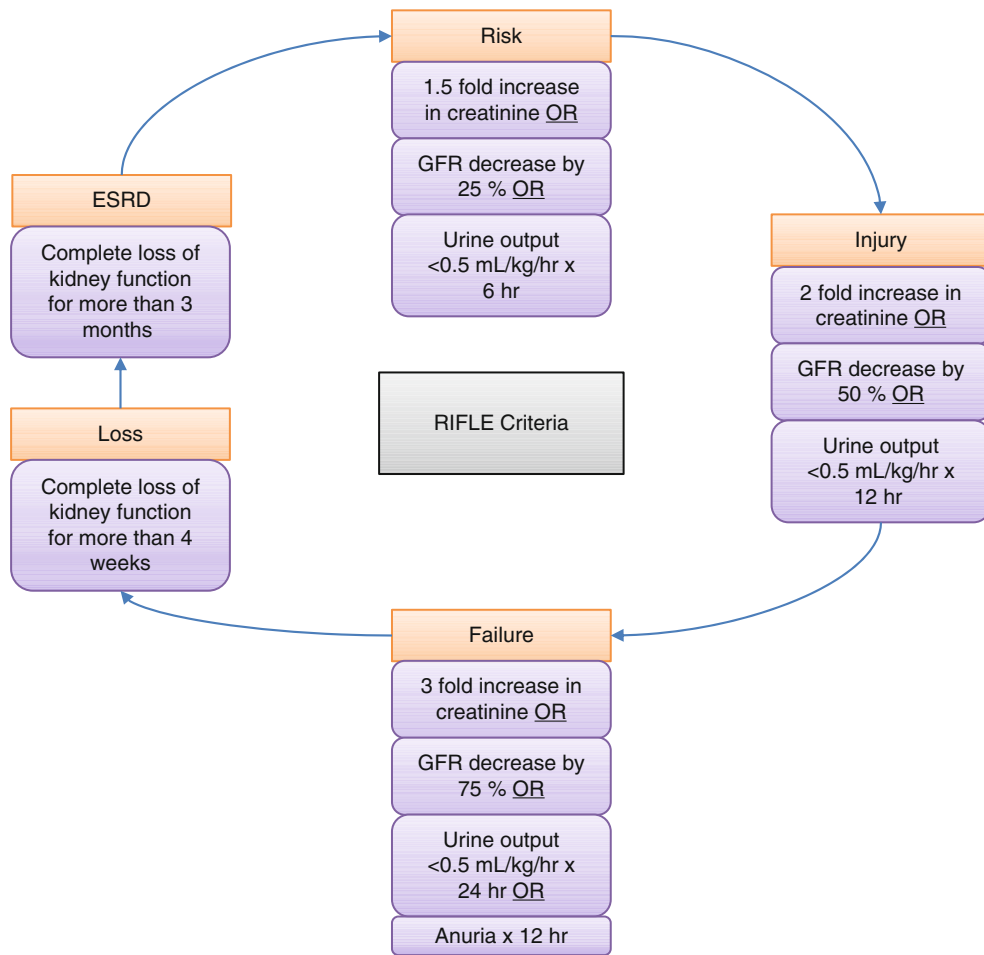
B. Desai, MD, MEd
Department of Emergency Medicine, University of Florida,
Gainesville, FL, USA
e-mail: bdesai@ufl.edu

Acute Renal Failure

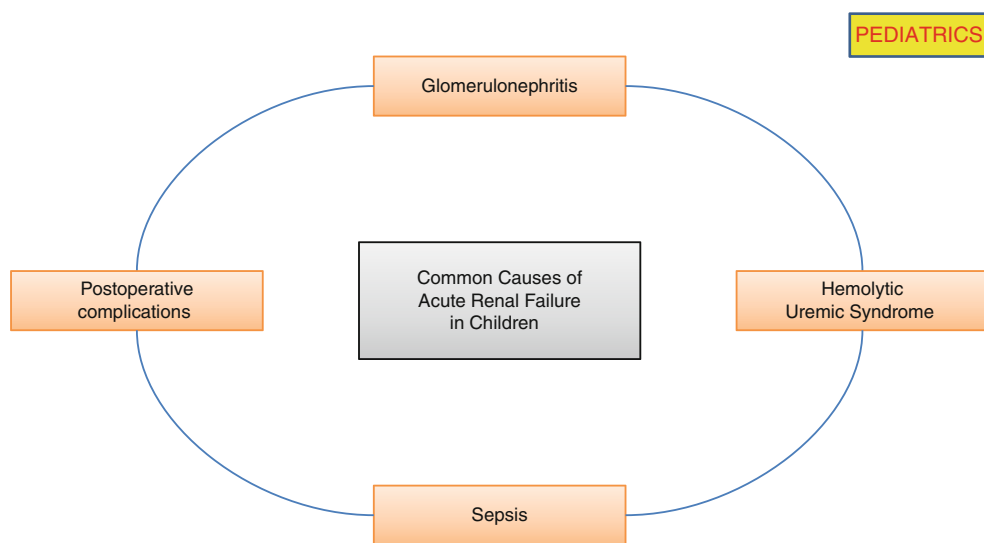
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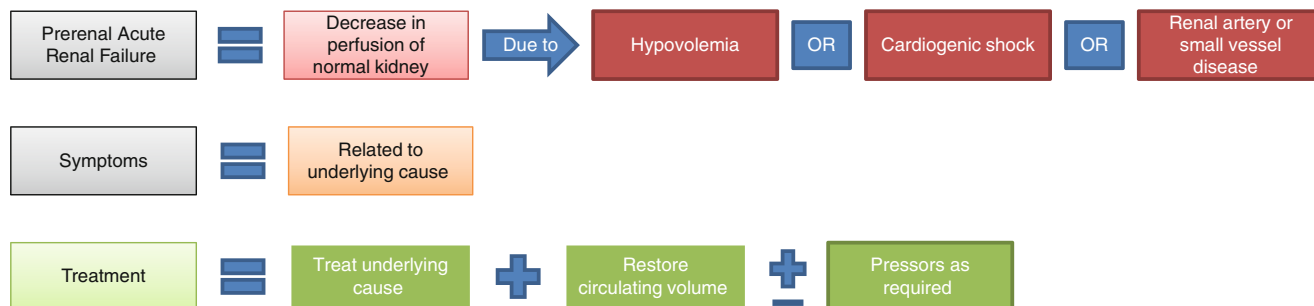
RIFLE Criteria



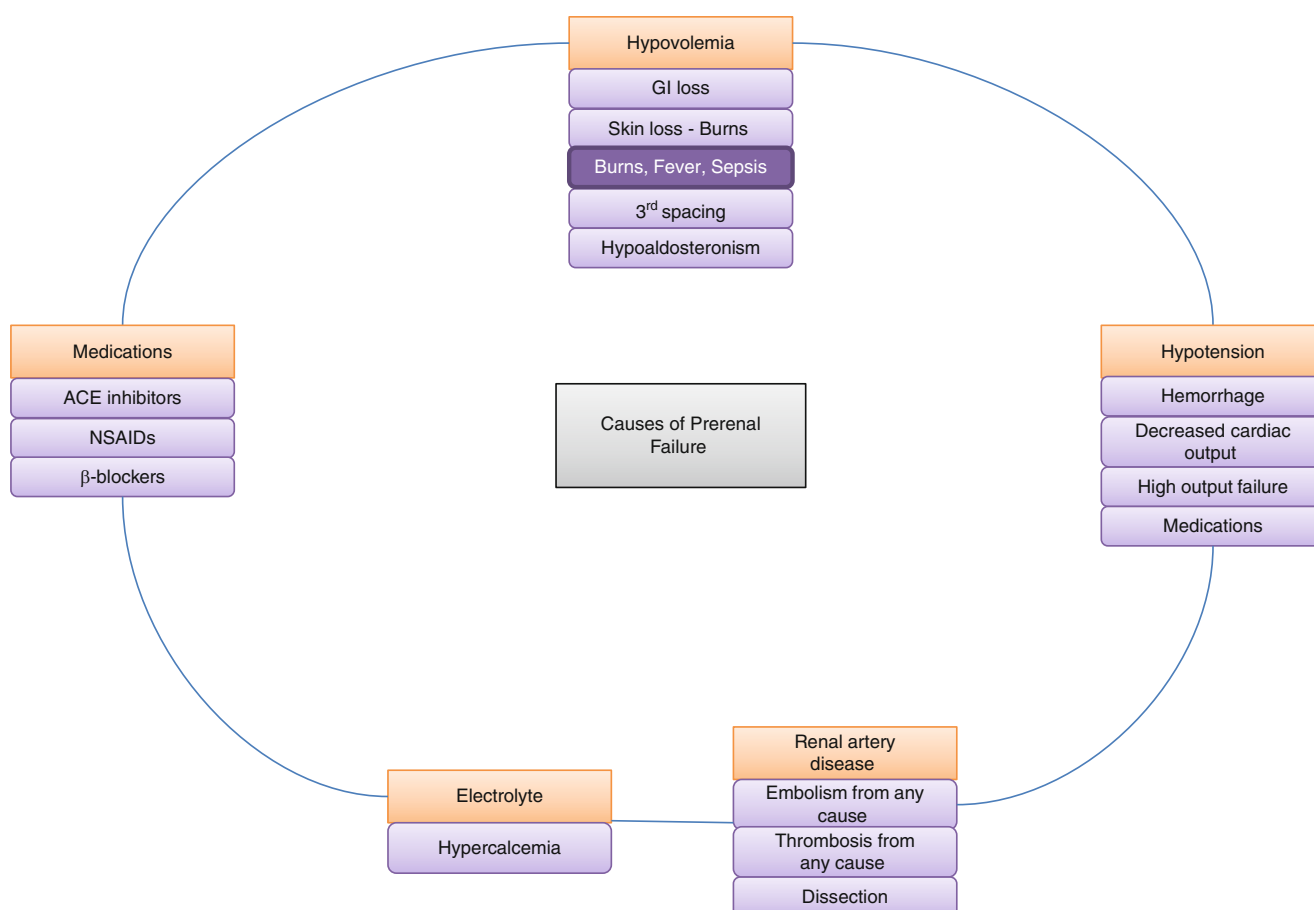
Common Causes of Acute Renal Failure in Children



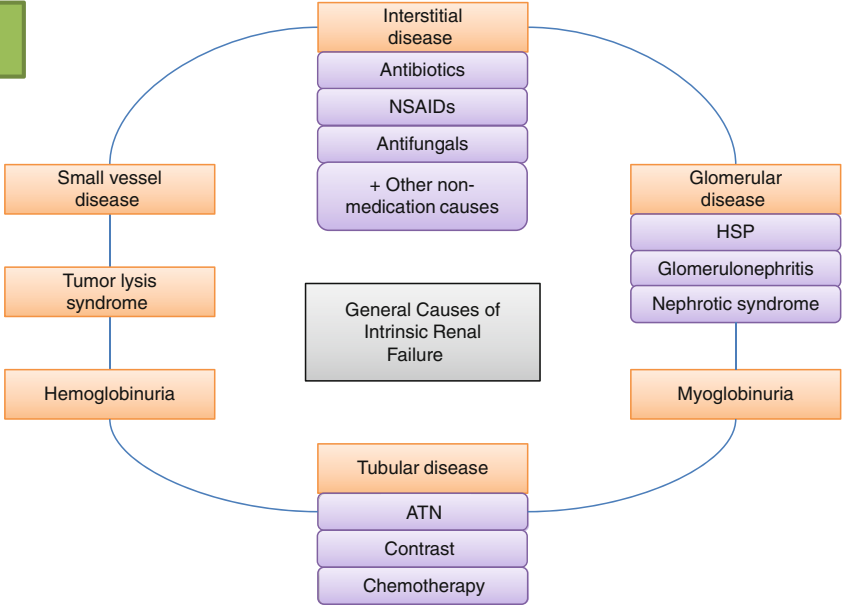
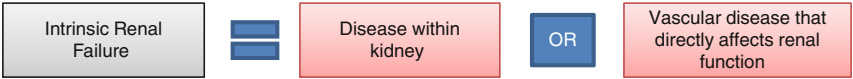
Prerenal Failure



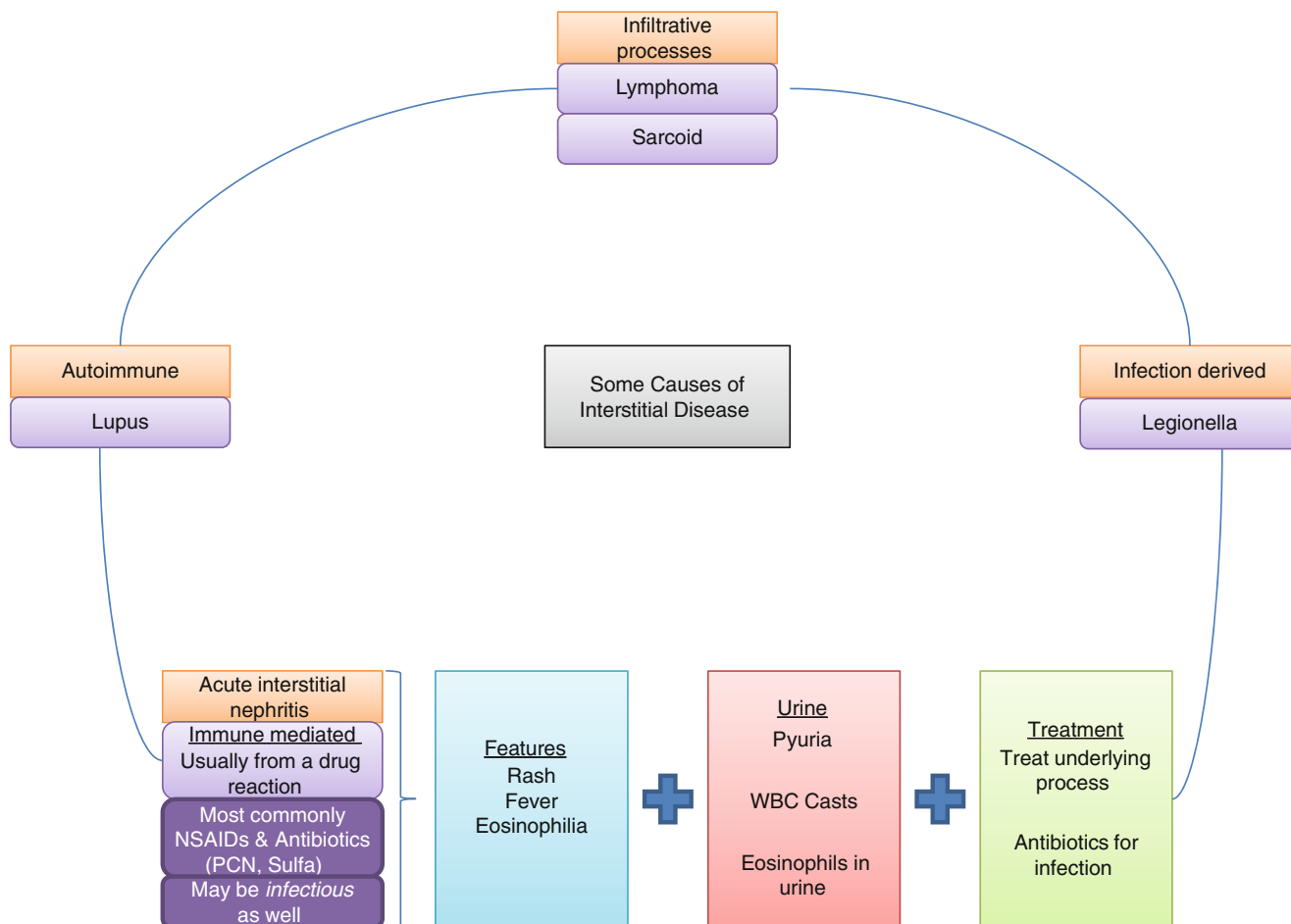
Causes of Prerenal Failure



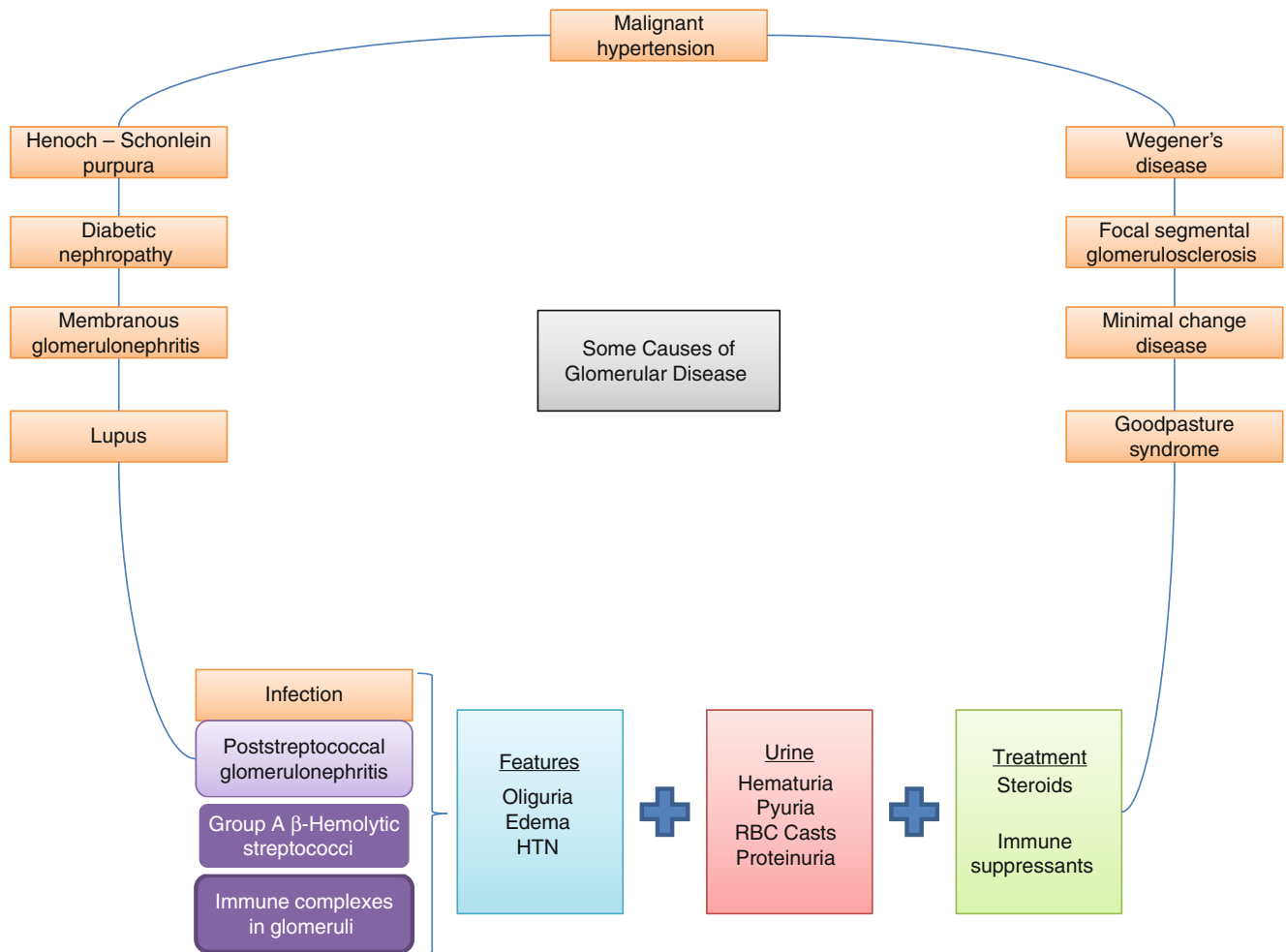
Intrinsic Renal Failure



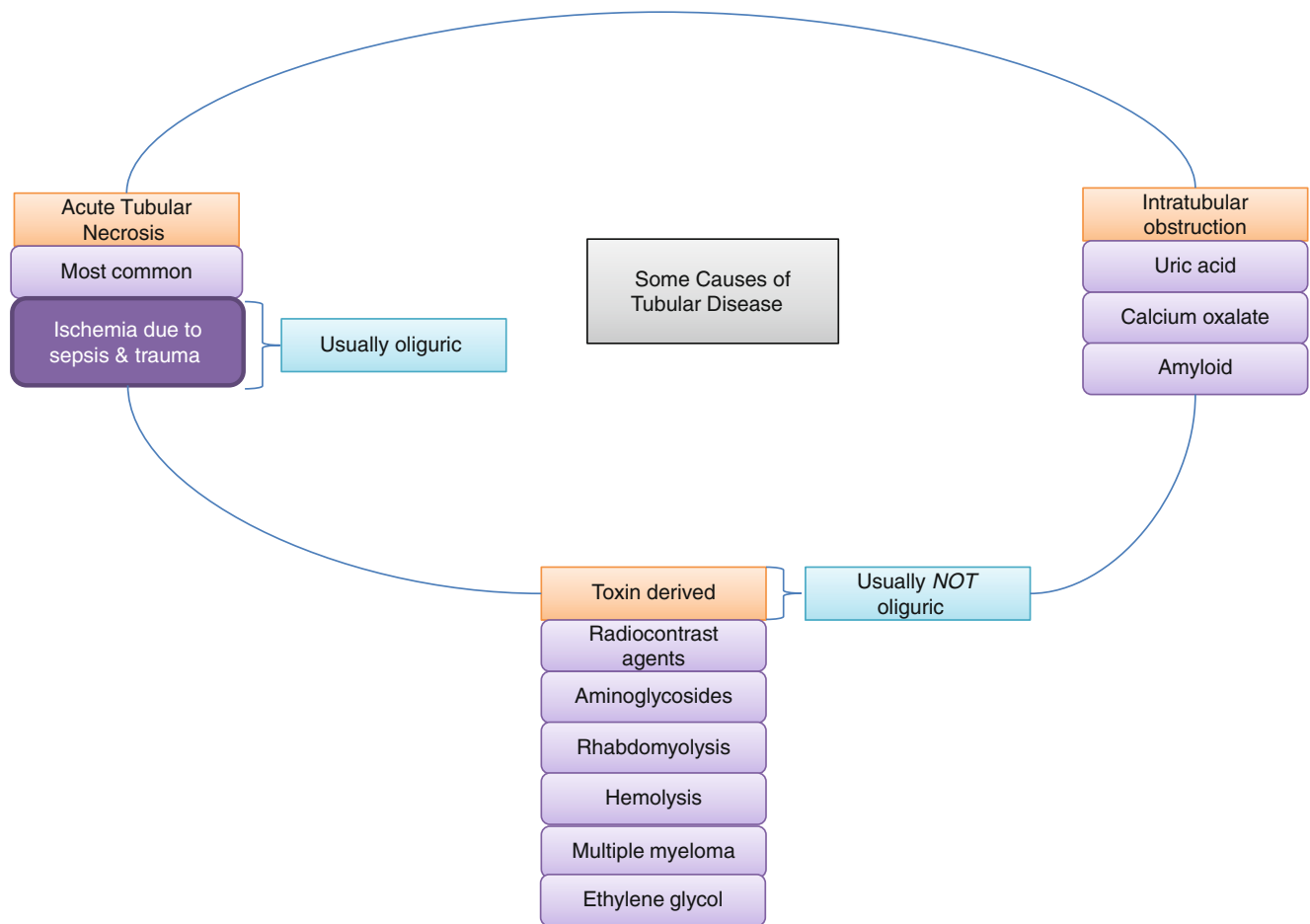
Some Causes of Interstitial Disease



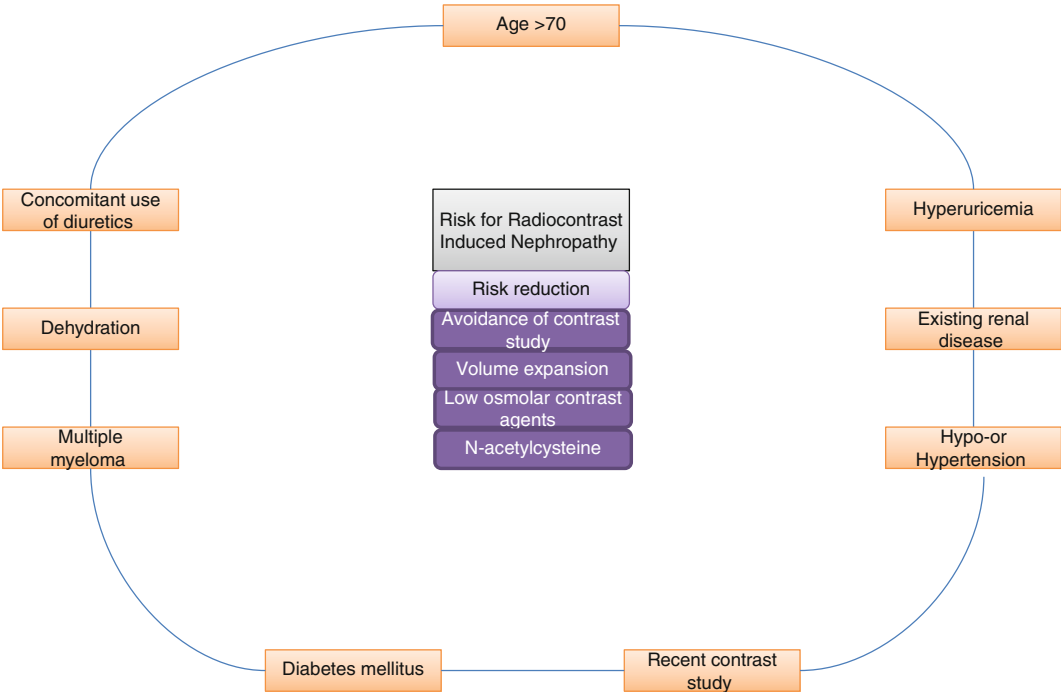
Some Causes of Glomerular Disease



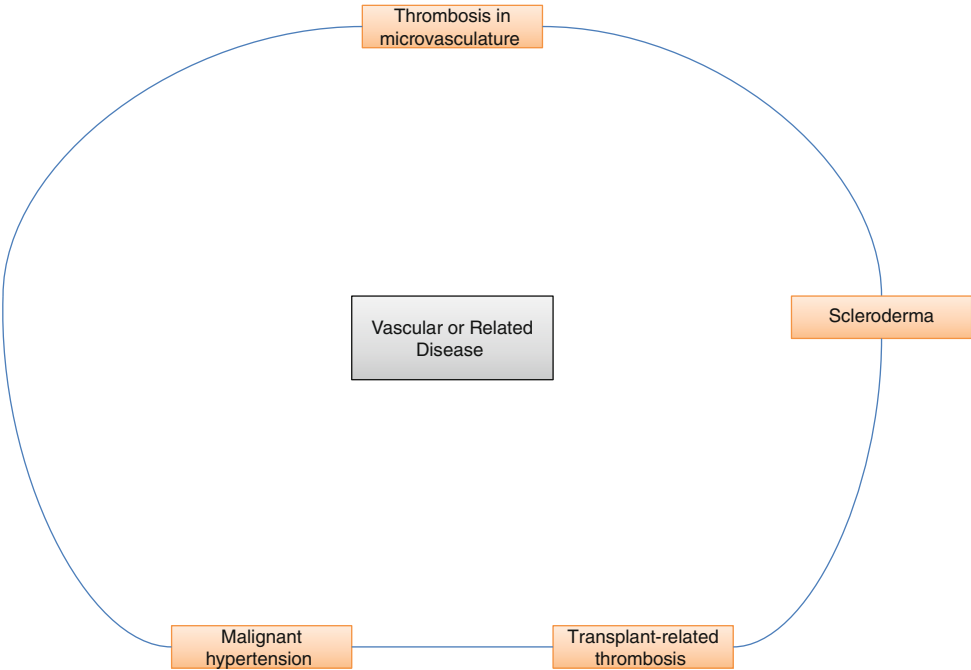
Some Causes of Tubular Disease



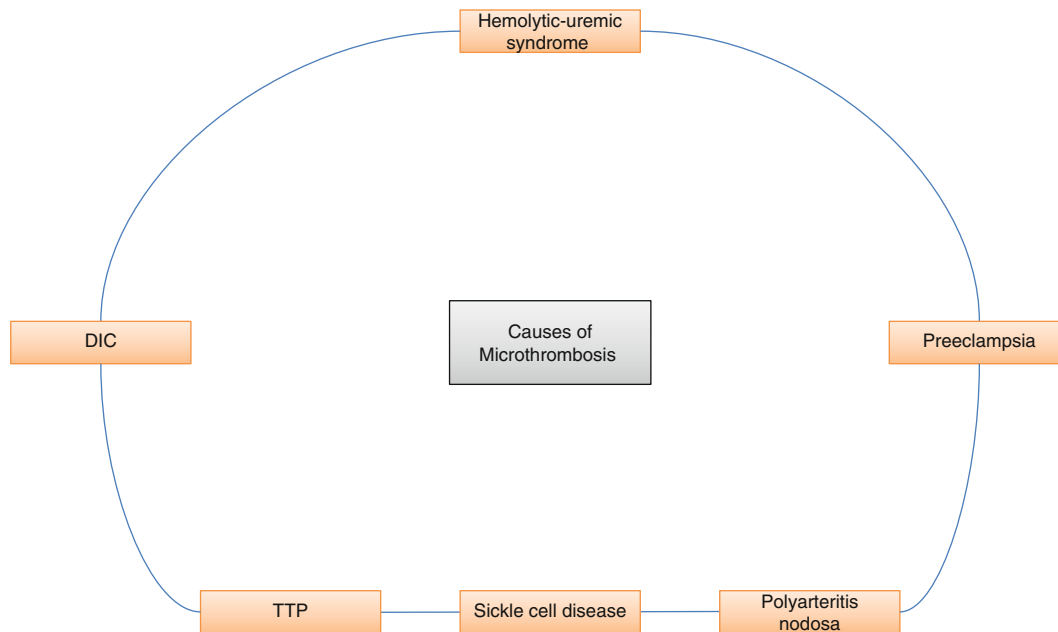
Risk for Radiocontrast-Induced Nephropathy



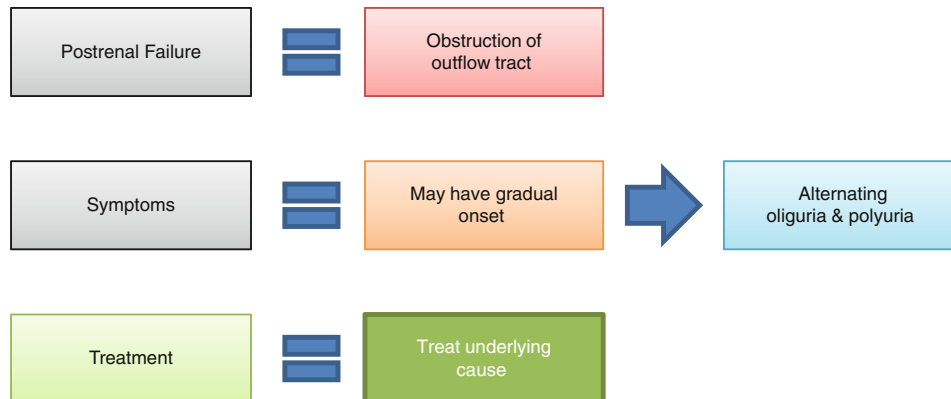
Vascular or Related Disease



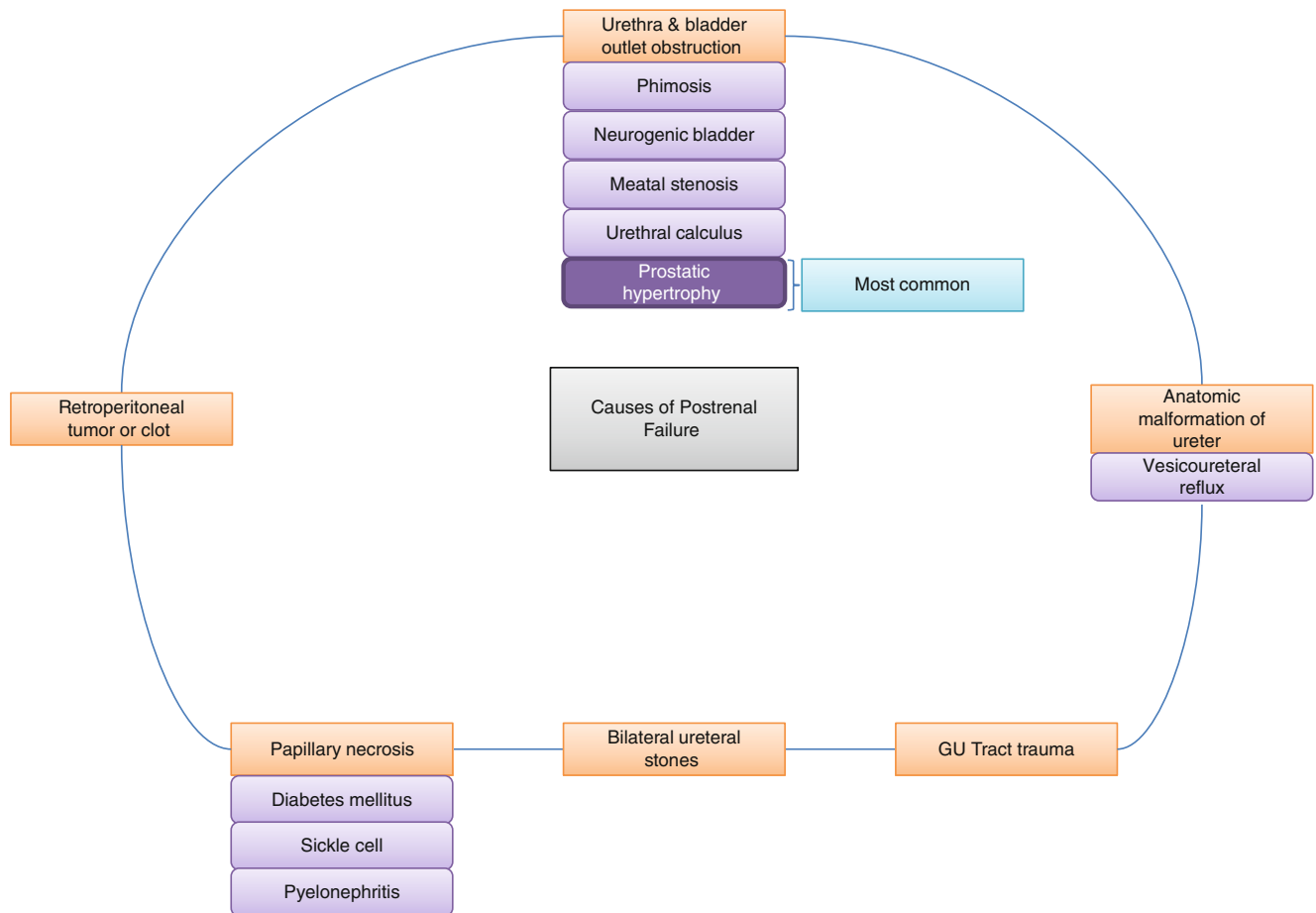
Causes of Microthrombosis



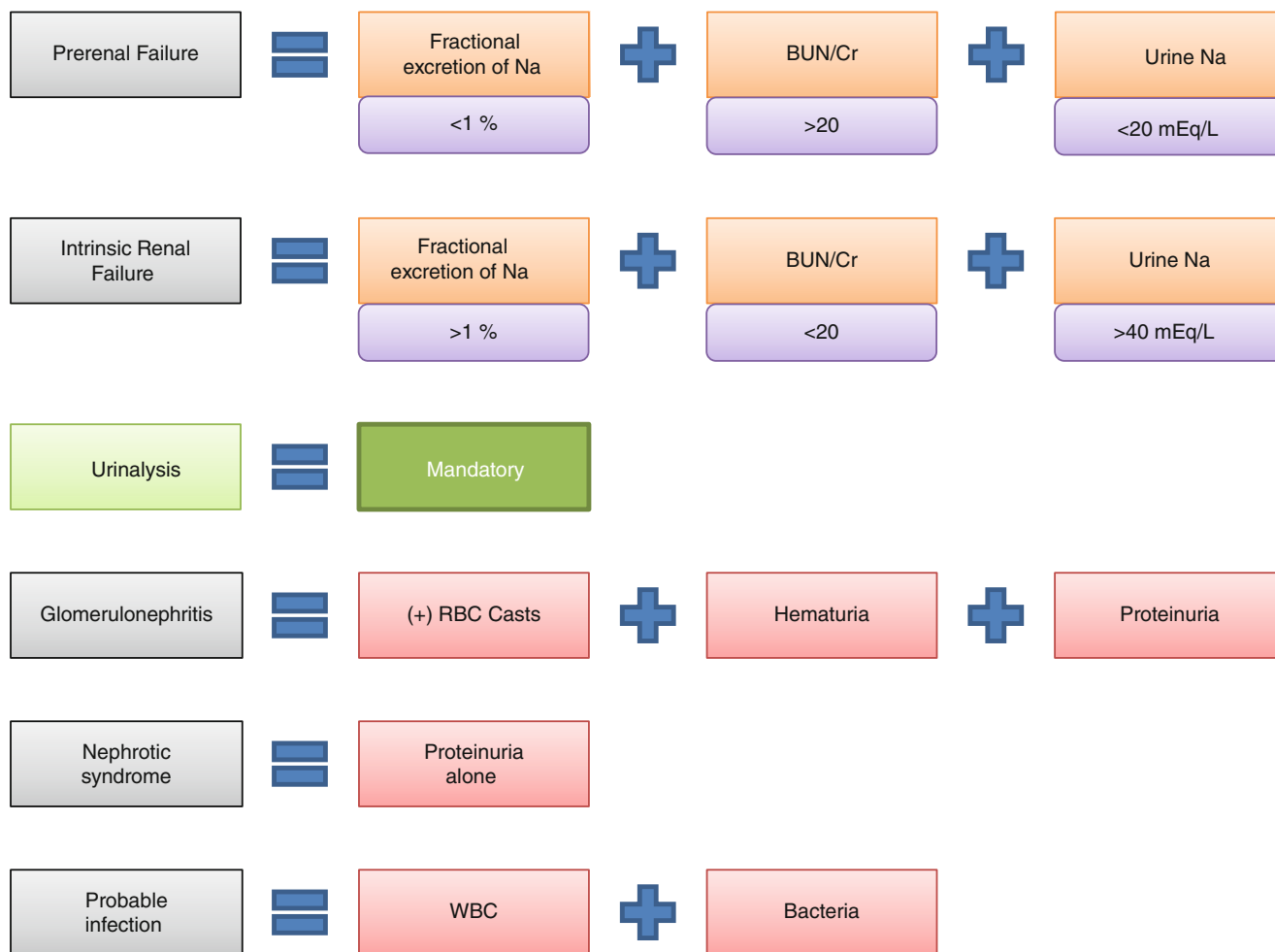
Postrenal Failure



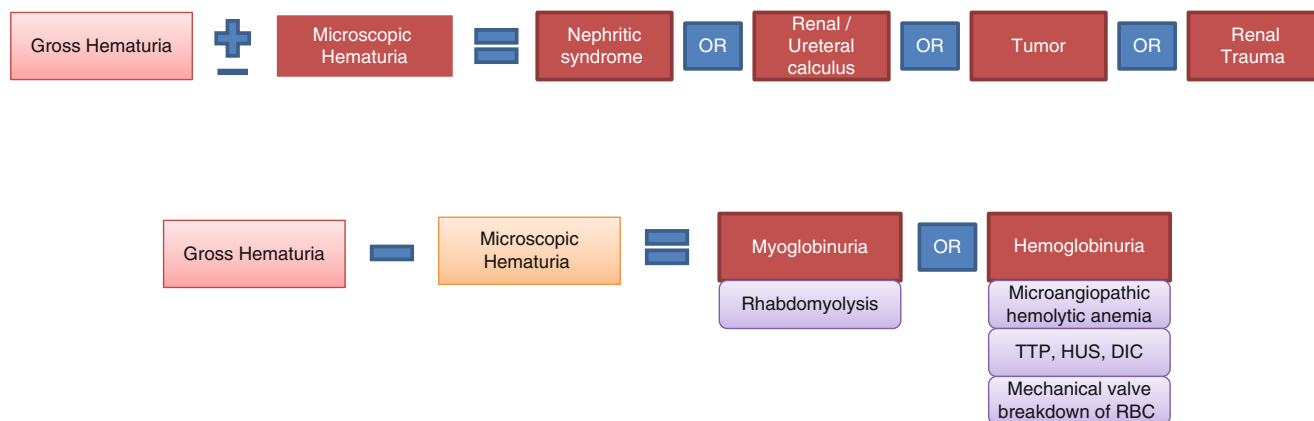
General Causes of Postrenal Failure



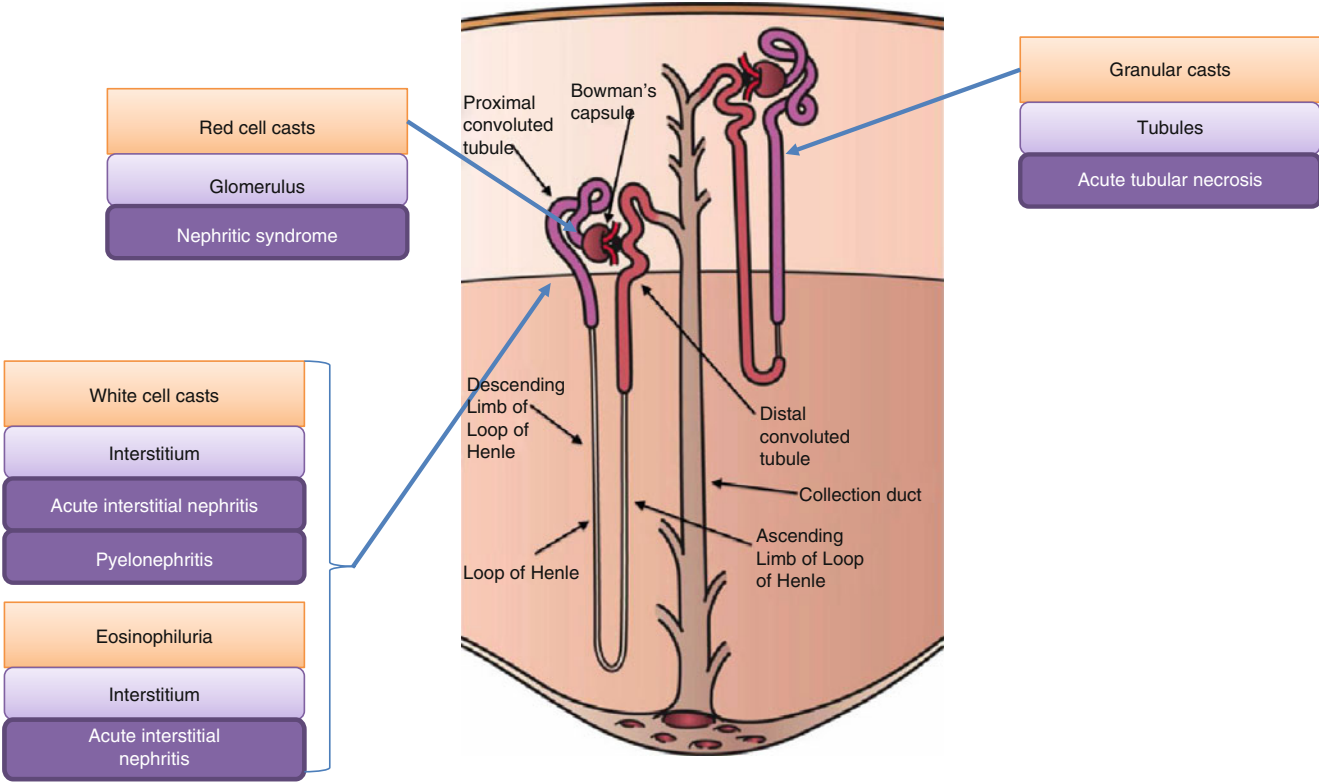
Some Laboratory Investigations for Renal Failure



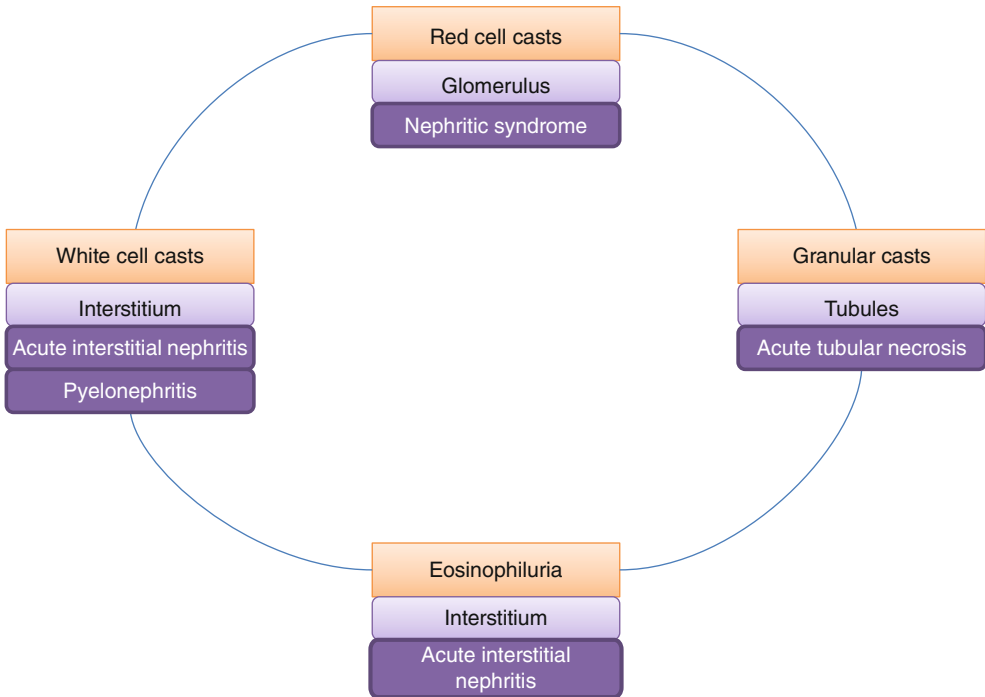
Macroscopic Urine



Urinalysis

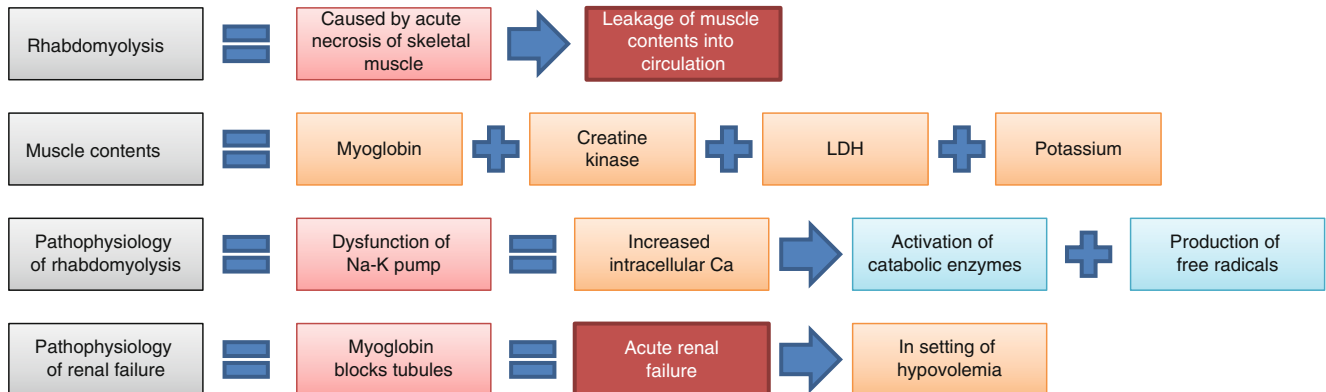


Center image (Adapted from Kidney Nephron: https://commons.wikimedia.org/wiki/File:Kidney_Nephron.png. Artwork by Holly Fischer with permission from Creative Commons License: <https://creativecommons.org/licenses/by/3.0/deed.en>)

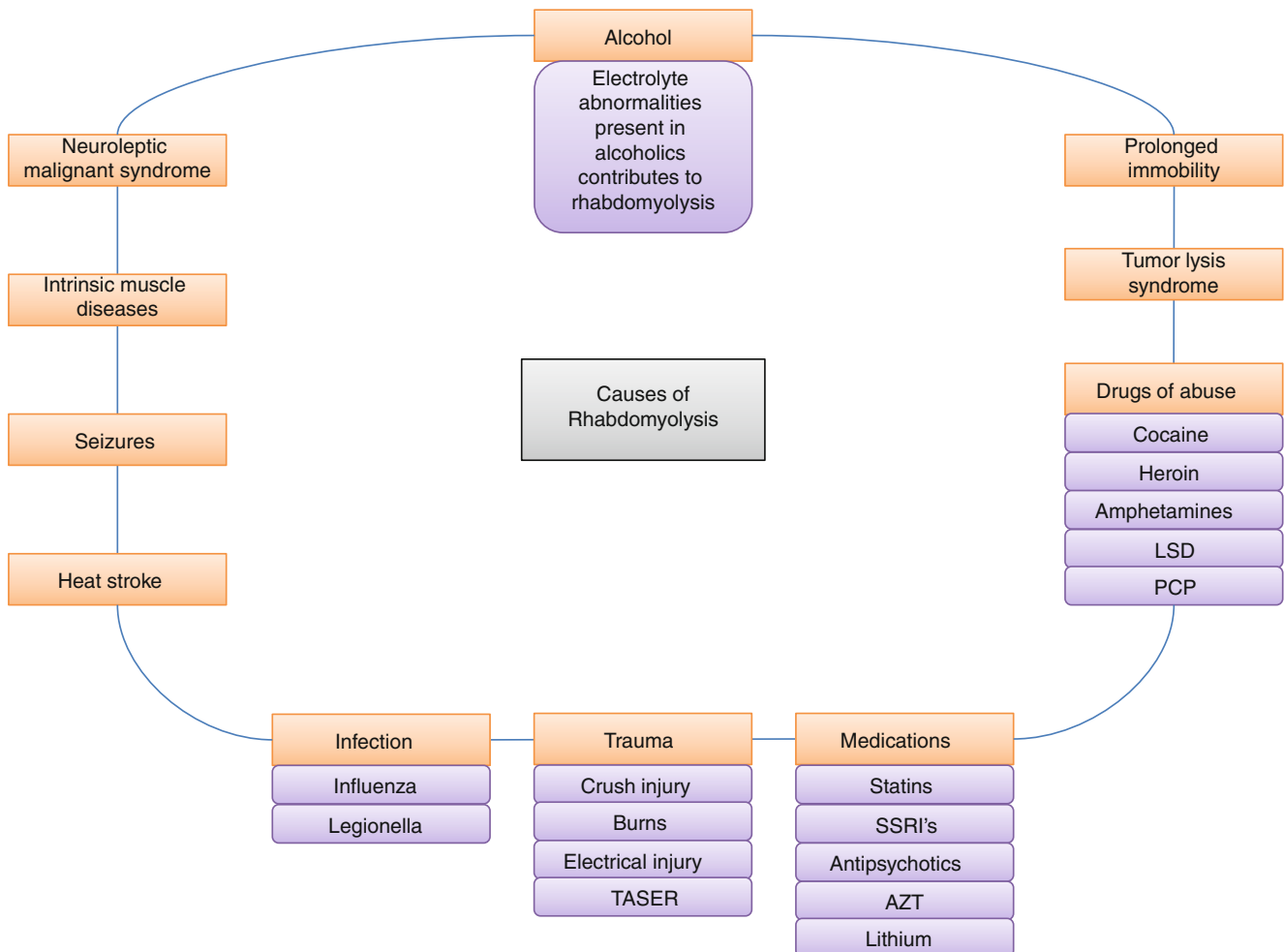


Rhabdomyolysis

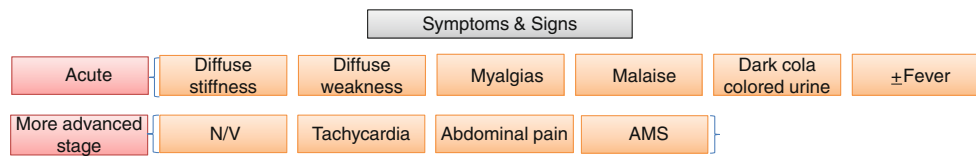
Introduction



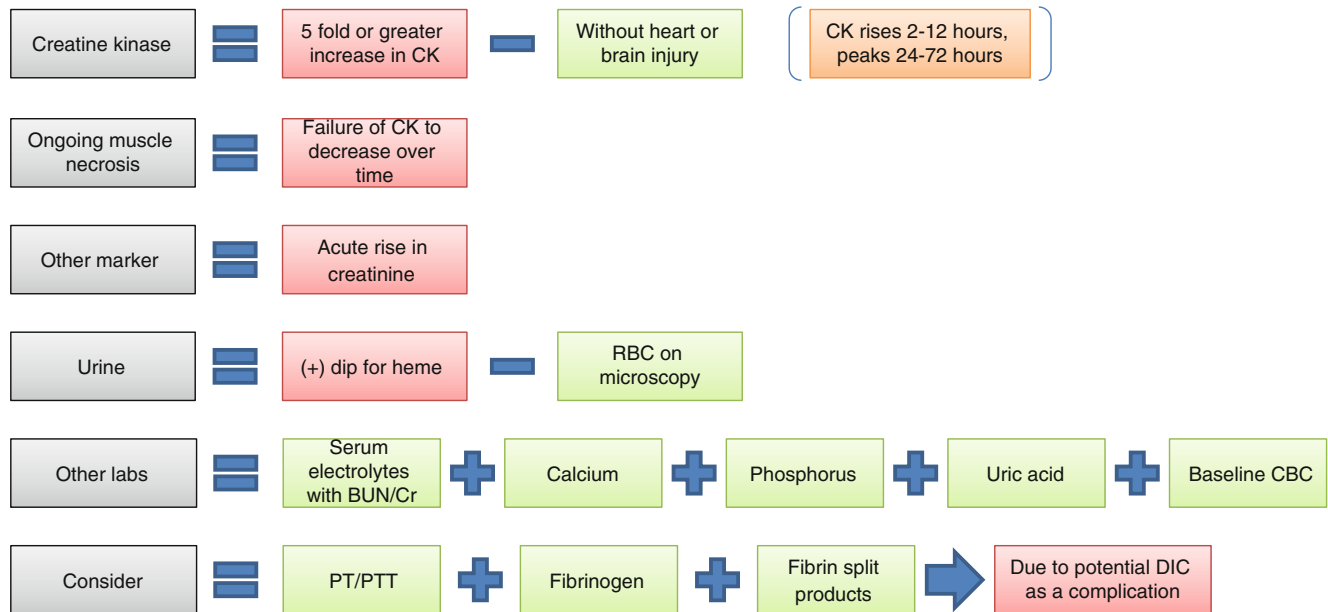
Causes of Rhabdomyolysis



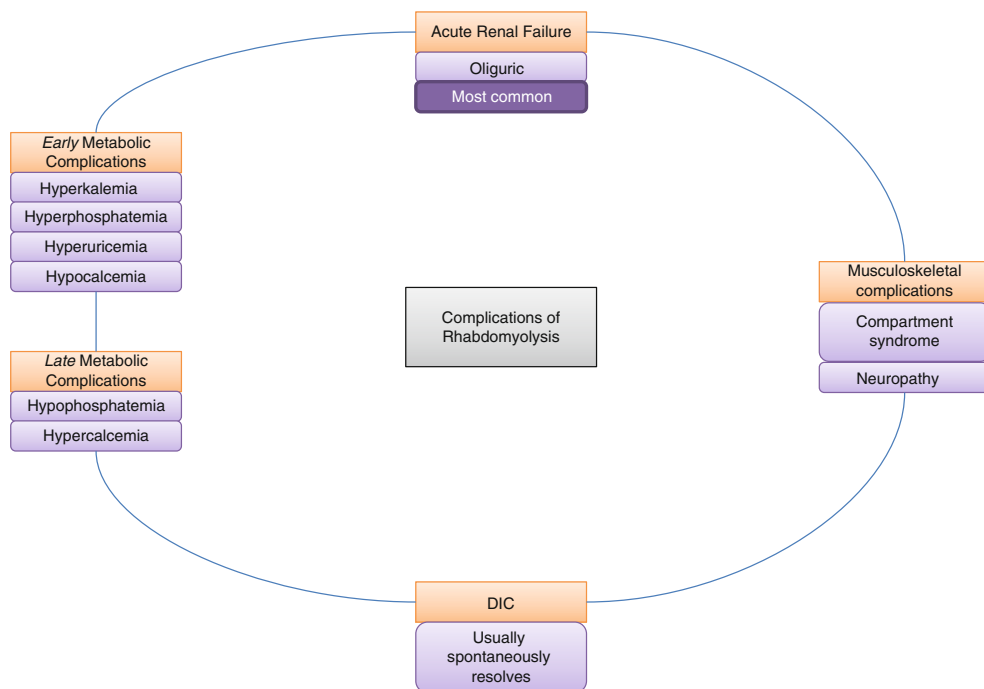
Clinical Features of Rhabdomyolysis



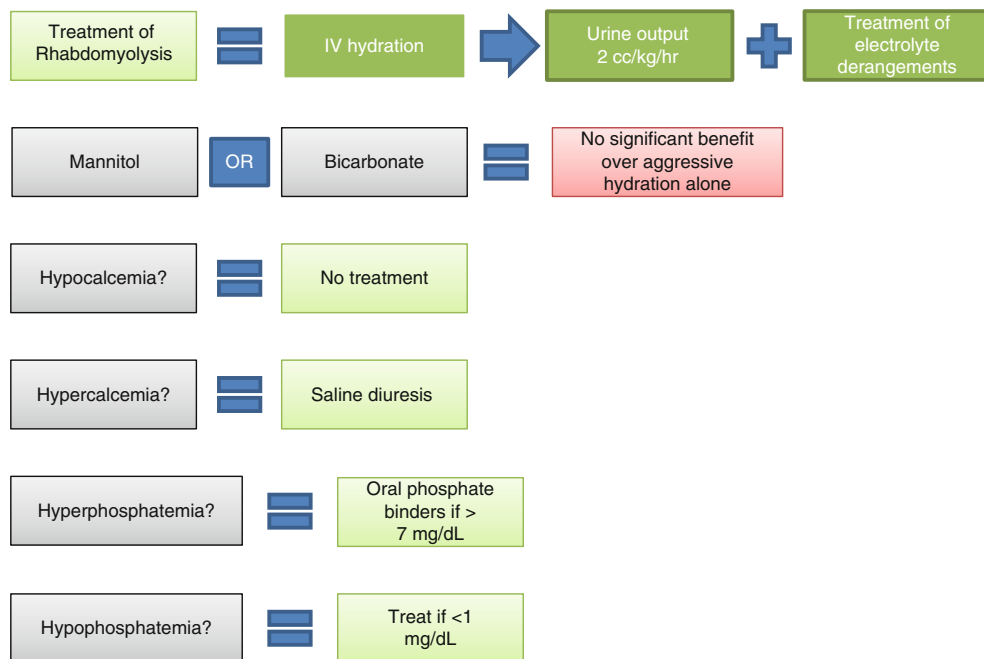
Diagnosis of Rhabdomyolysis



Complications of Rhabdomyolysis



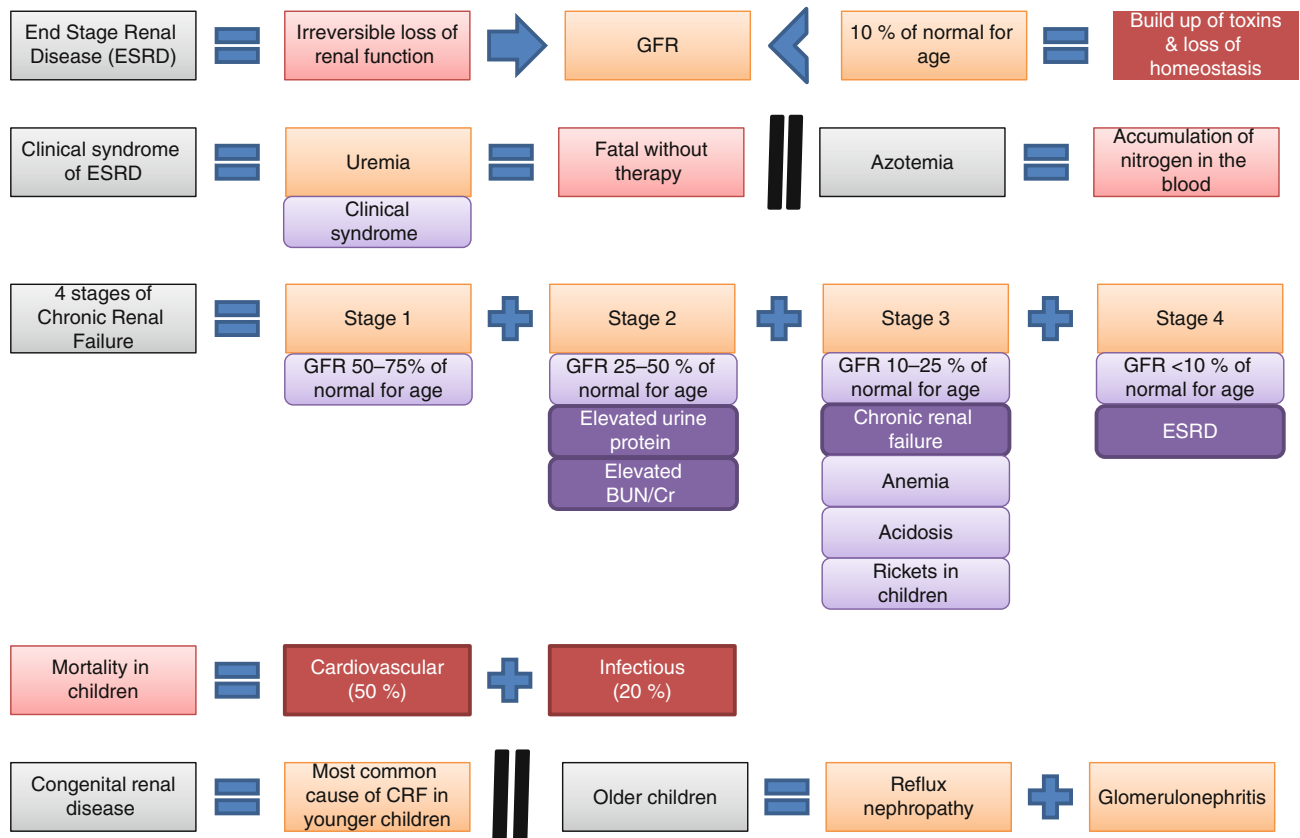
Treatment of Rhabdomyolysis



Chronic Renal Failure

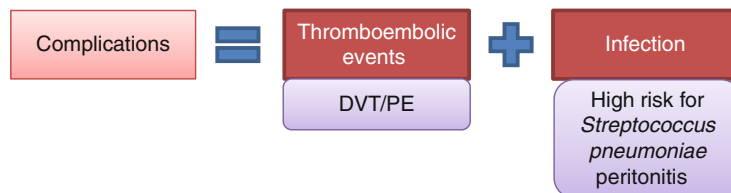
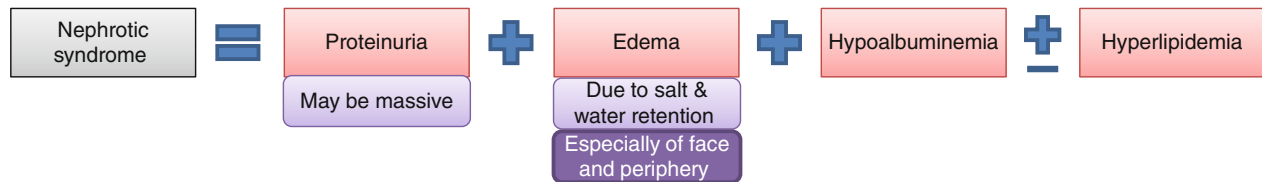
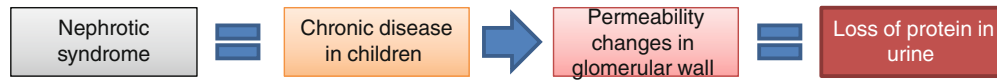
Chronic Renal Failure and End-Stage Renal Disease (ESRD)

PEDIATRICS

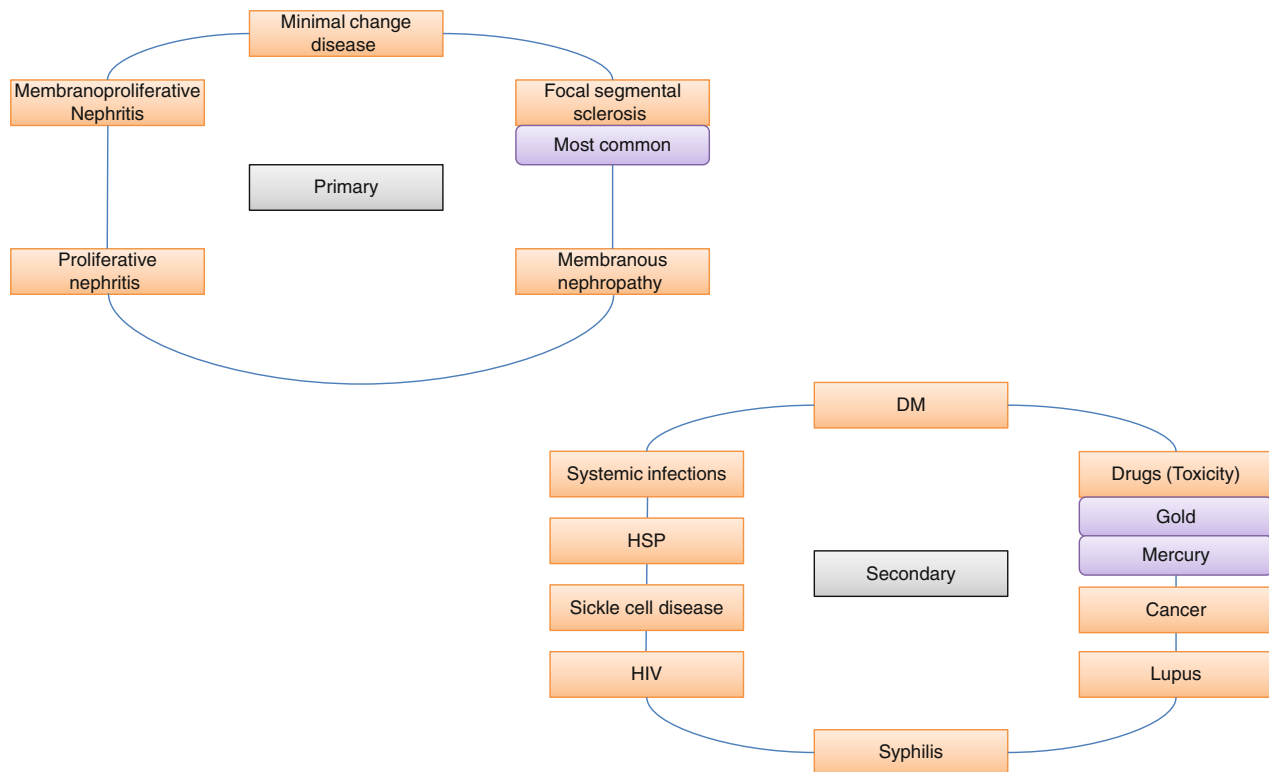


Nephrotic Syndrome

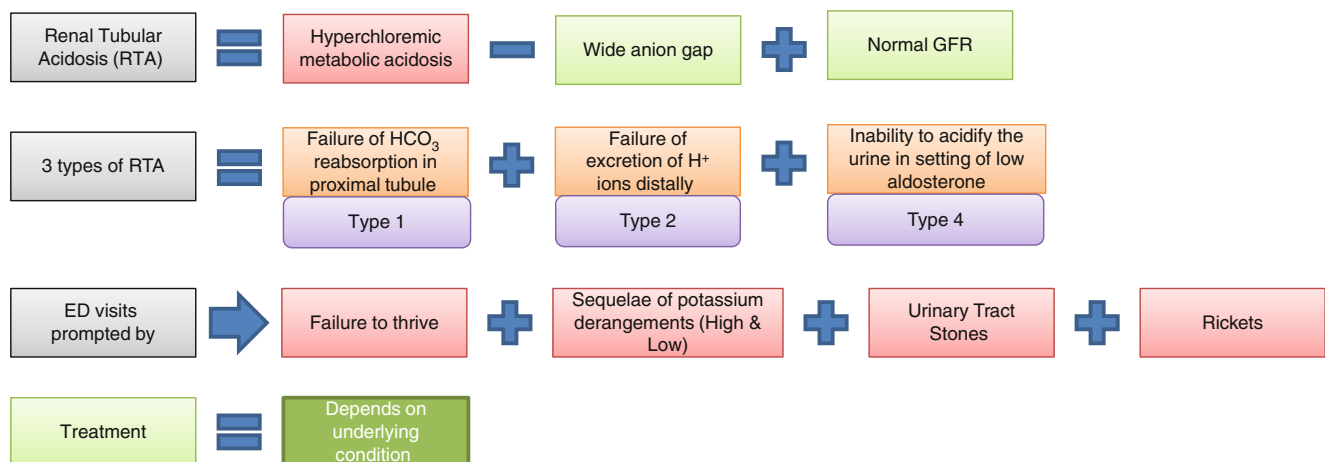
PEDIATRICS



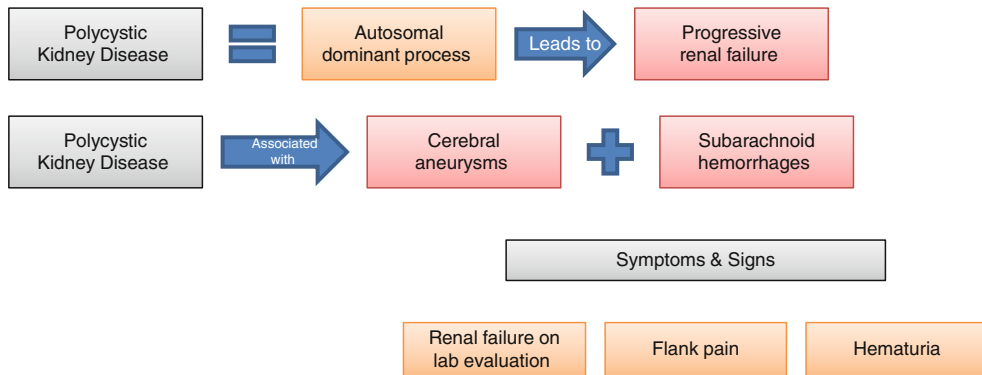
Causes of Nephrotic Syndrome

PEDIATRICS


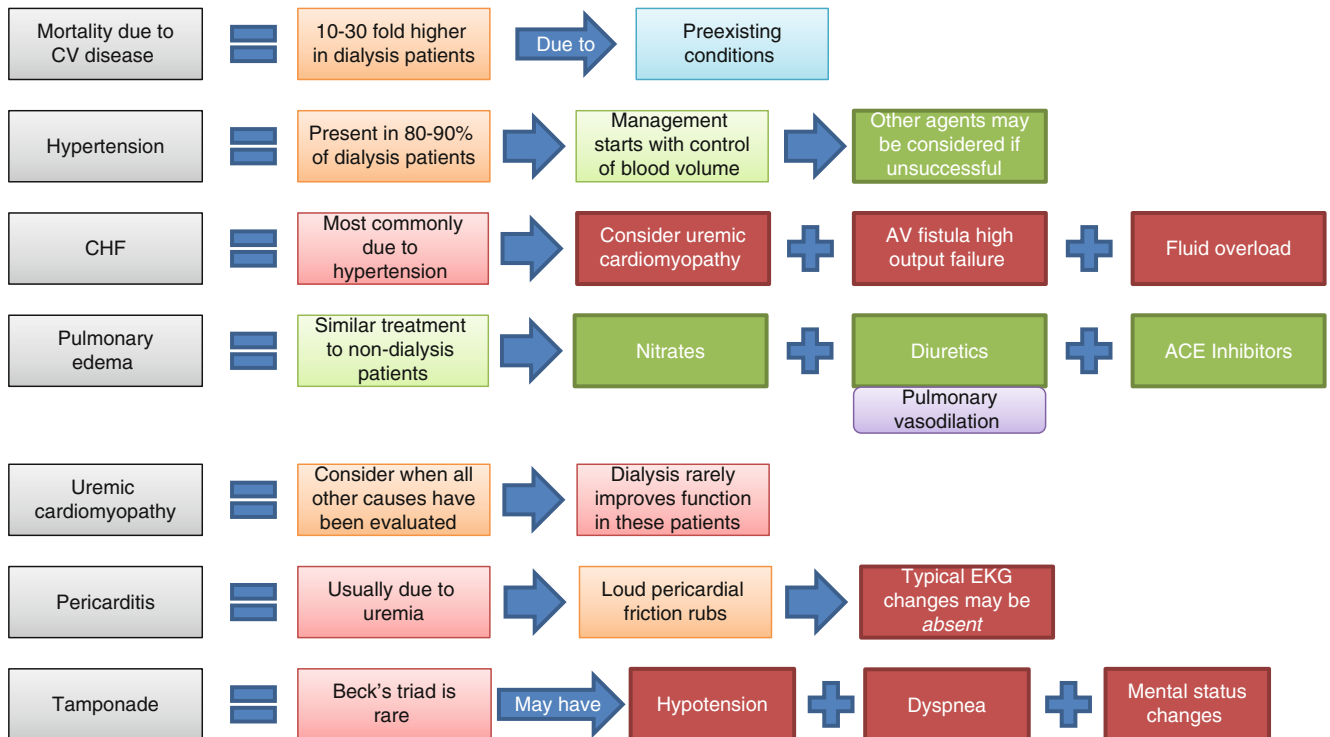
Renal Tubular Acidosis

PEDIATRICS


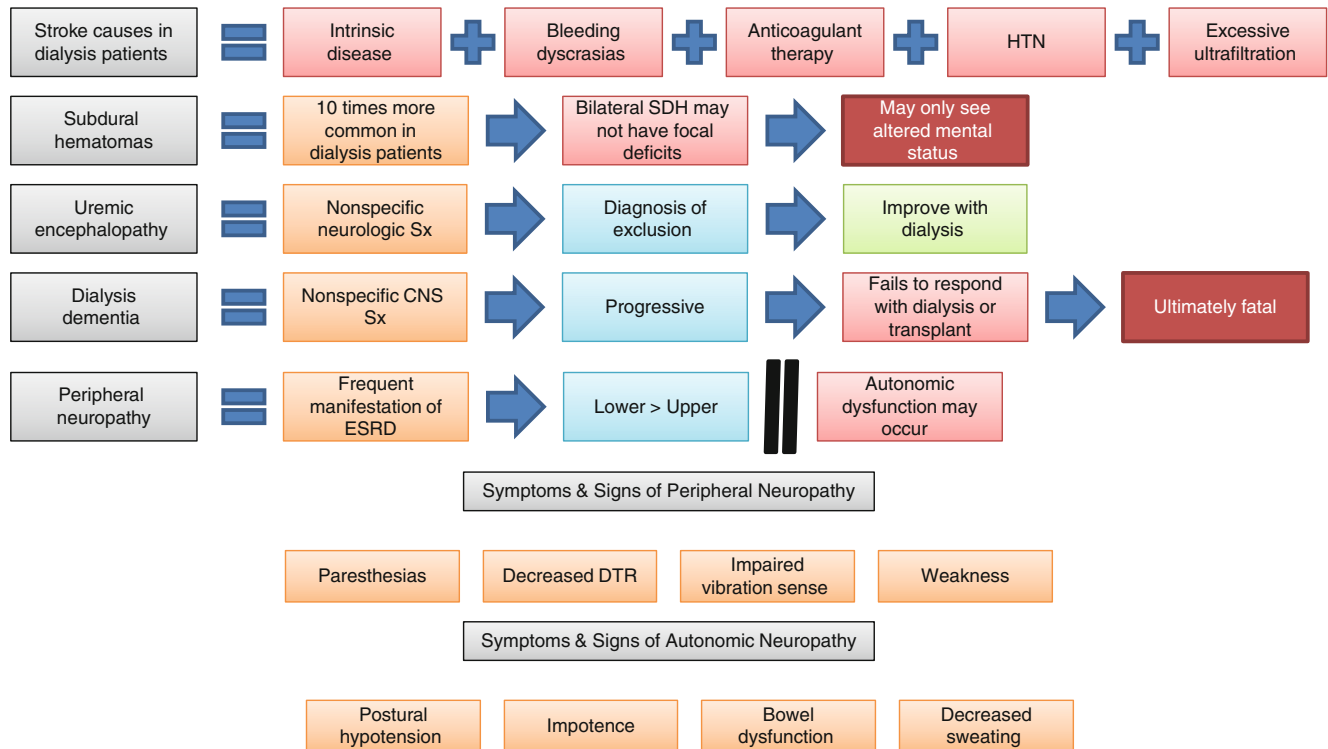
Polycystic Kidney Disease



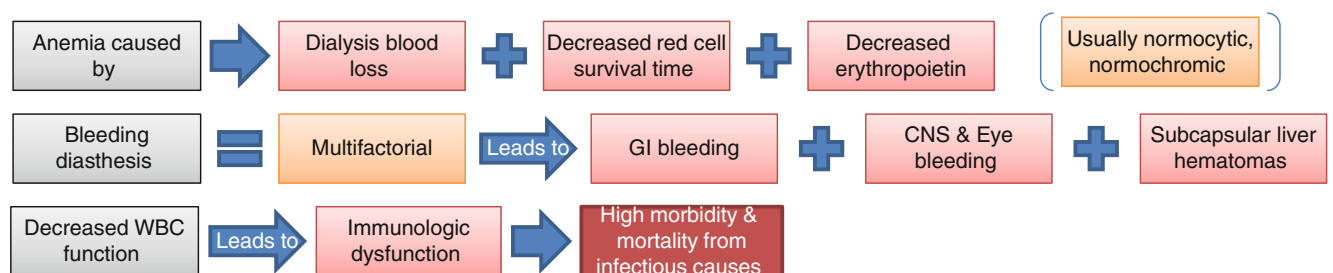
Cardiovascular Complications of Uremia



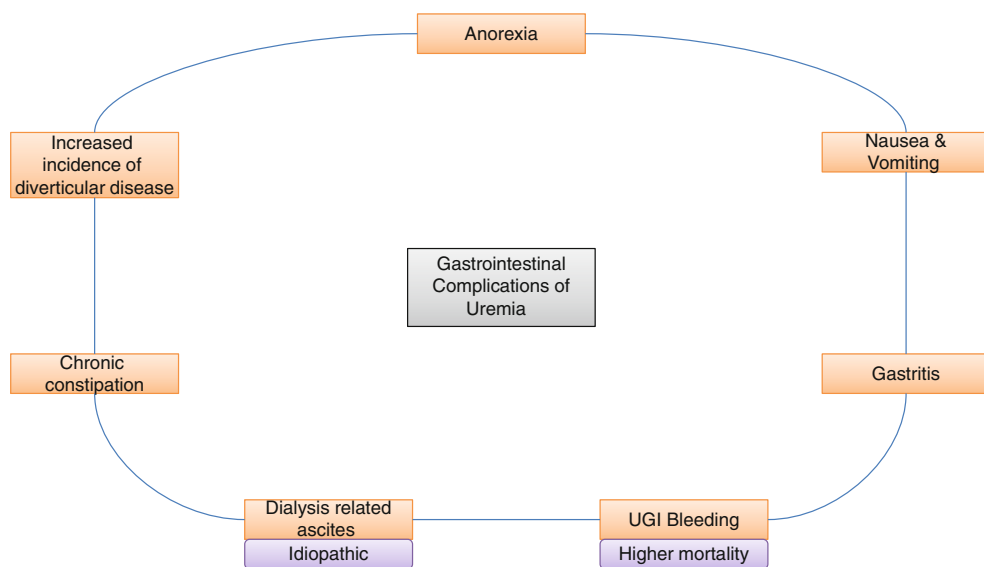
Neurologic Complications of Uremia



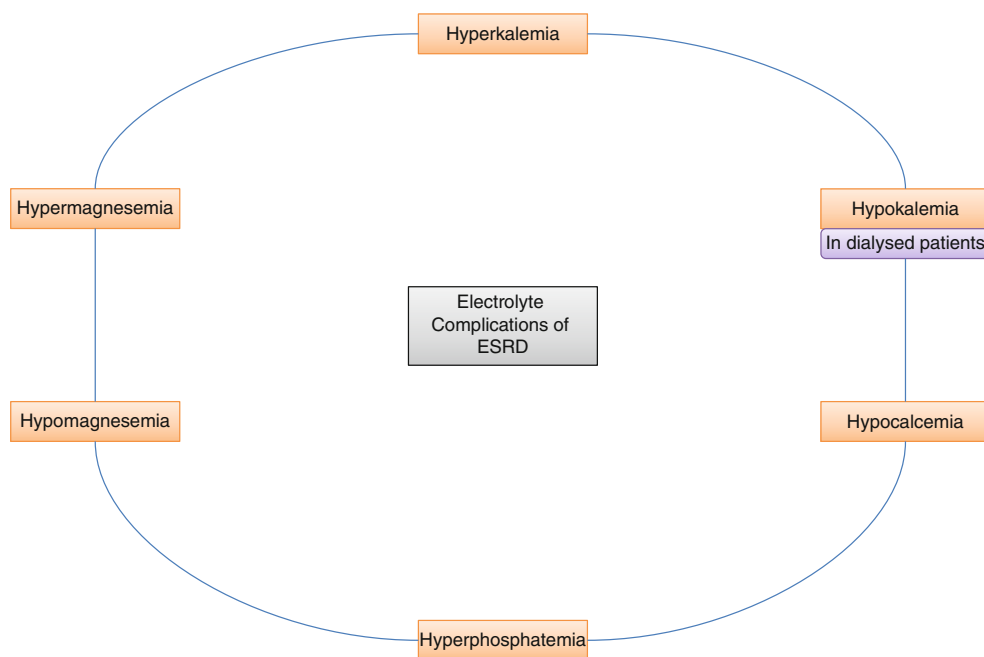
Hematologic Complications of Uremia



Gastrointestinal Complications of Uremia

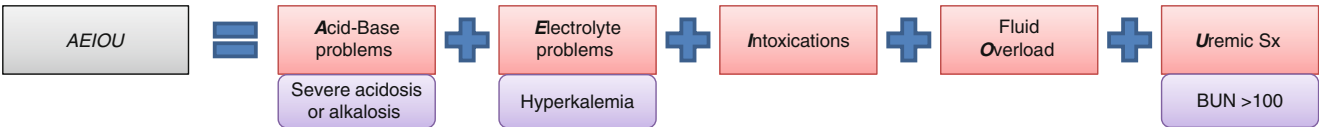
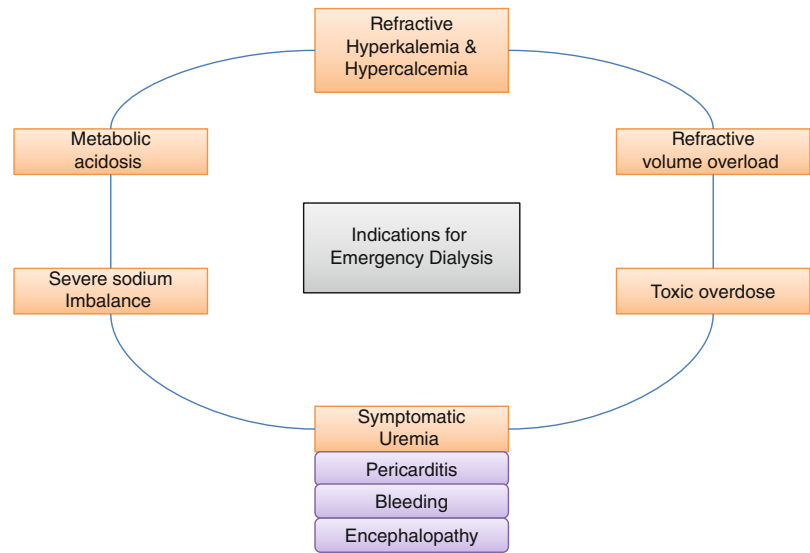


Electrolyte Complications of ESRD

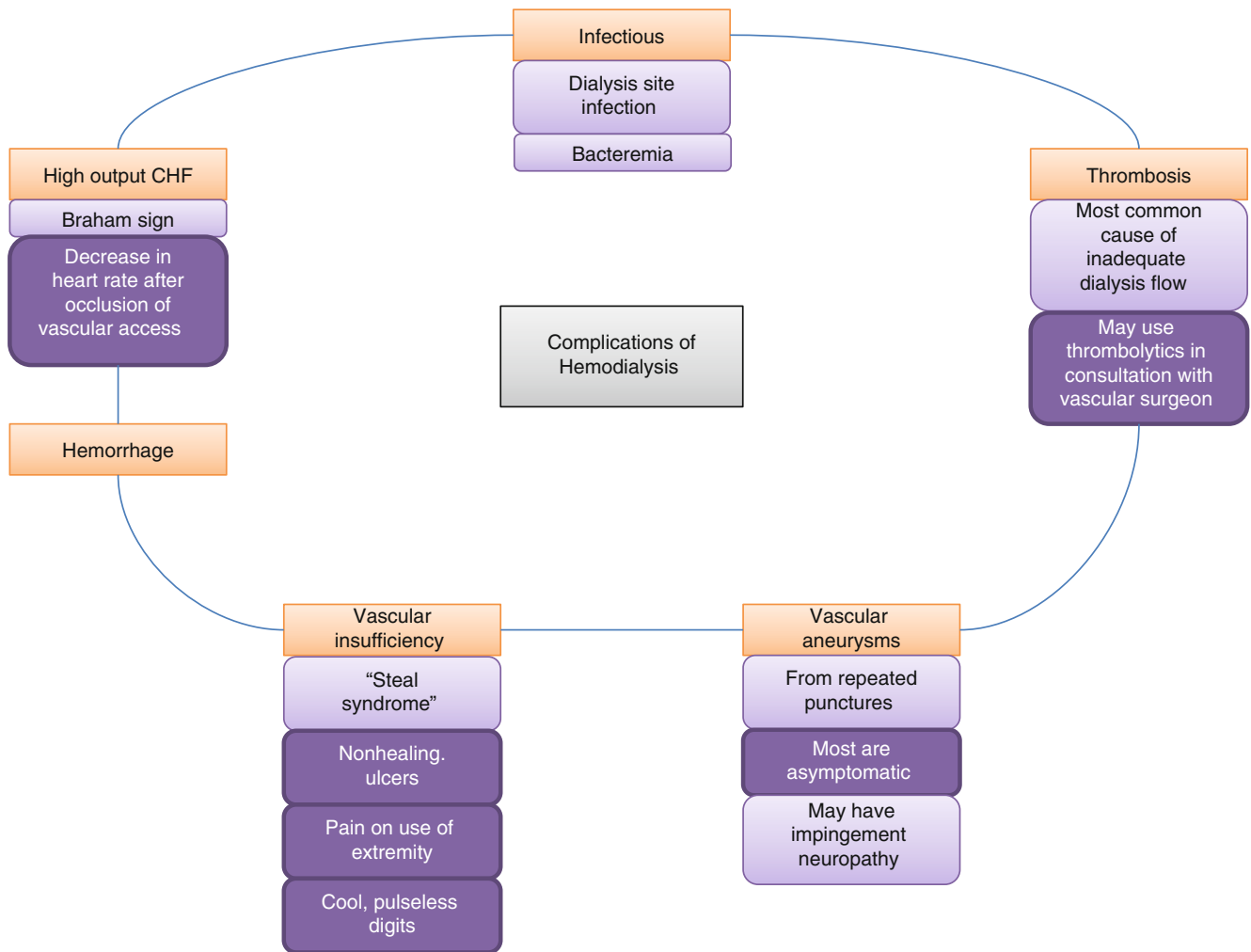


Hemodialysis

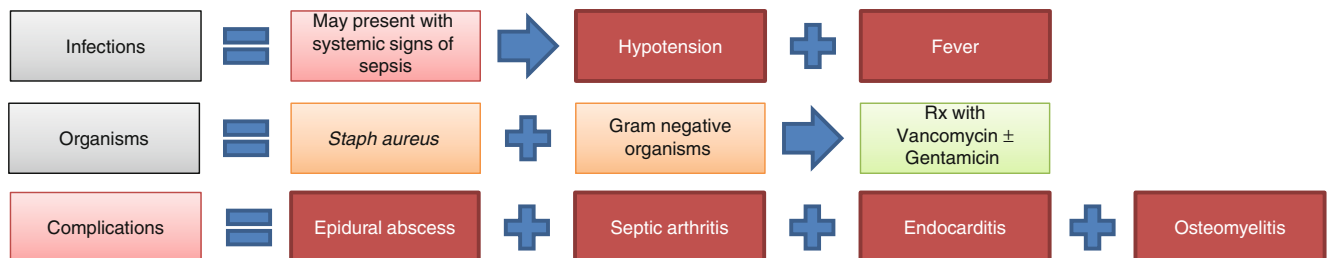
Indications for Emergency Dialysis



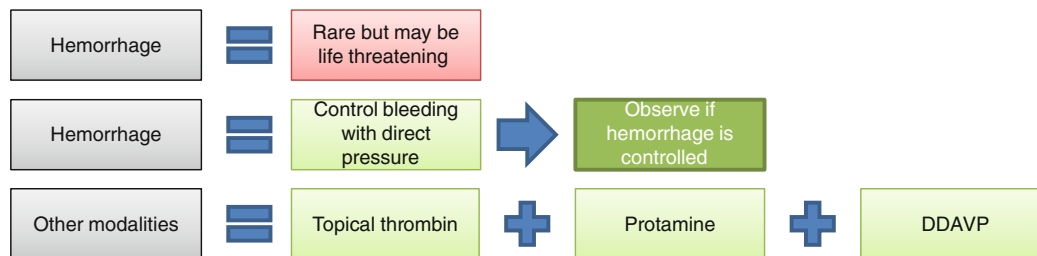
Complications of Hemodialysis



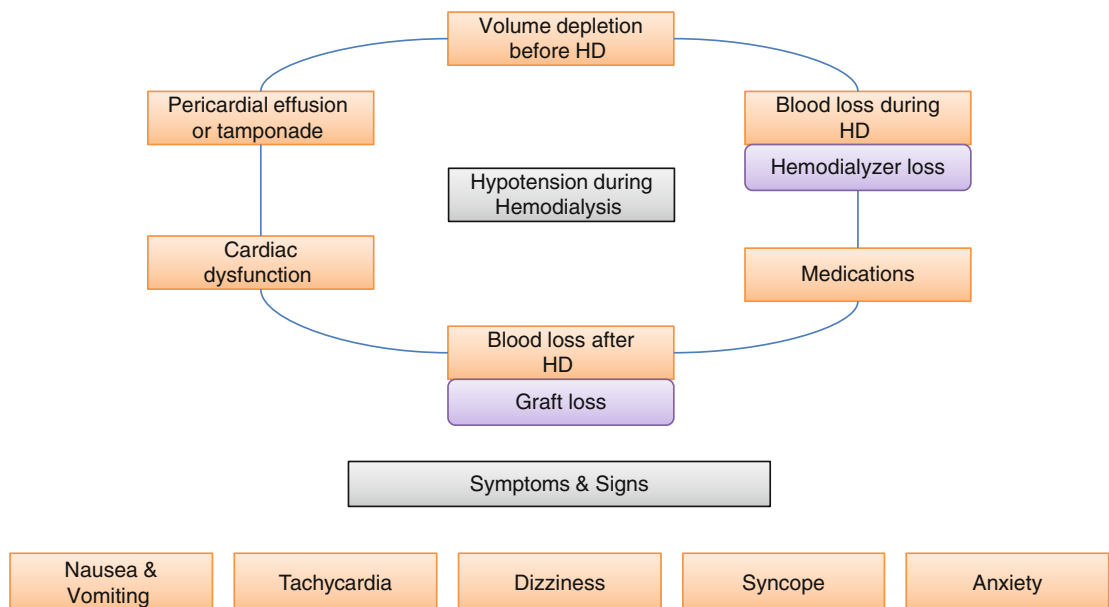
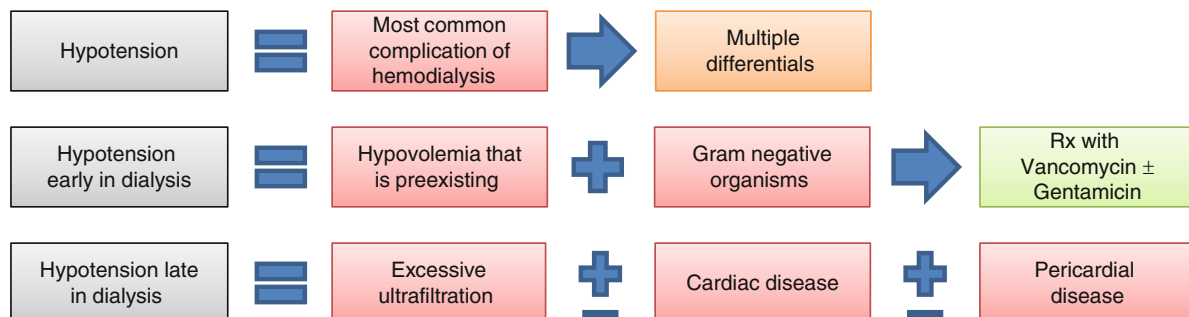
Infectious Complications of Hemodialysis



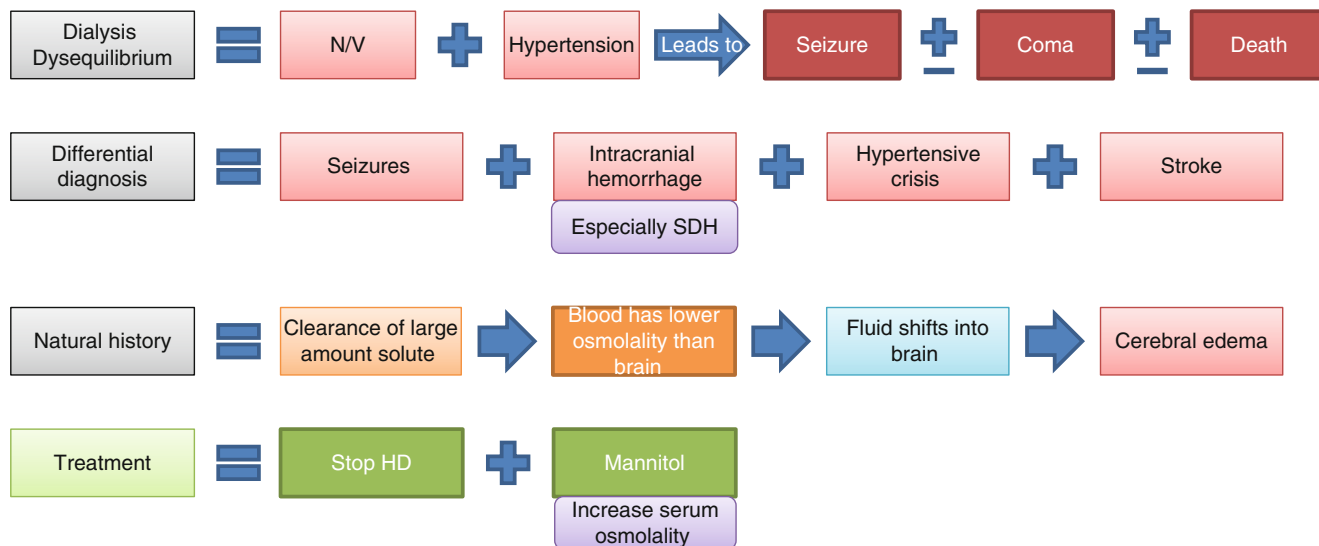
Hemorrhagic Complications of Hemodialysis



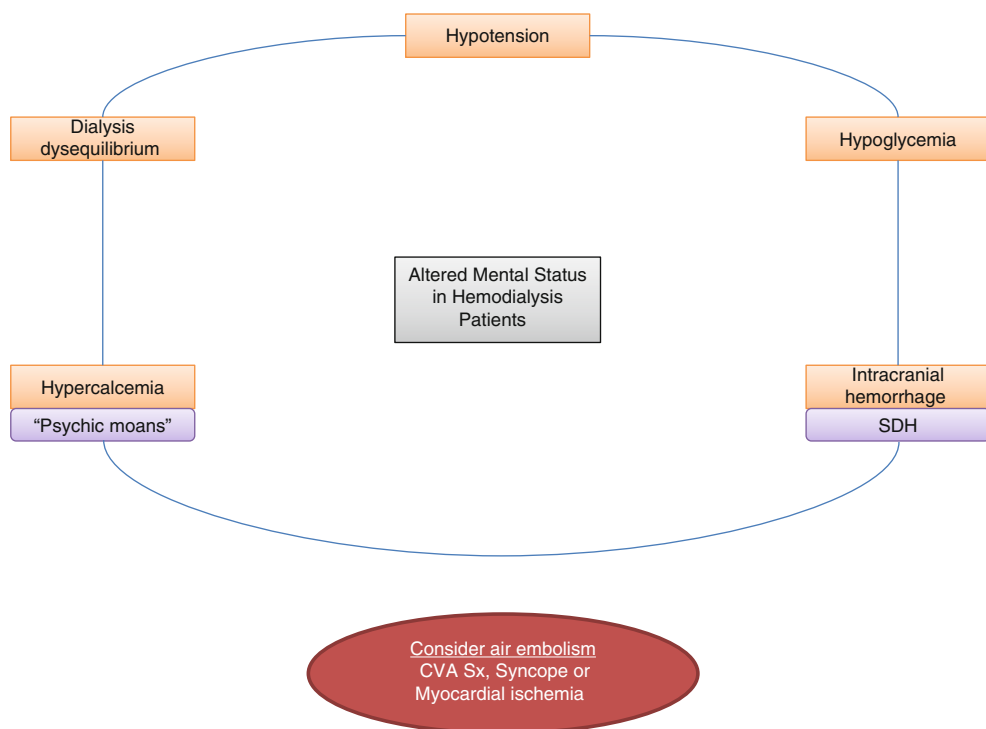
Hypotension During Hemodialysis (HD)



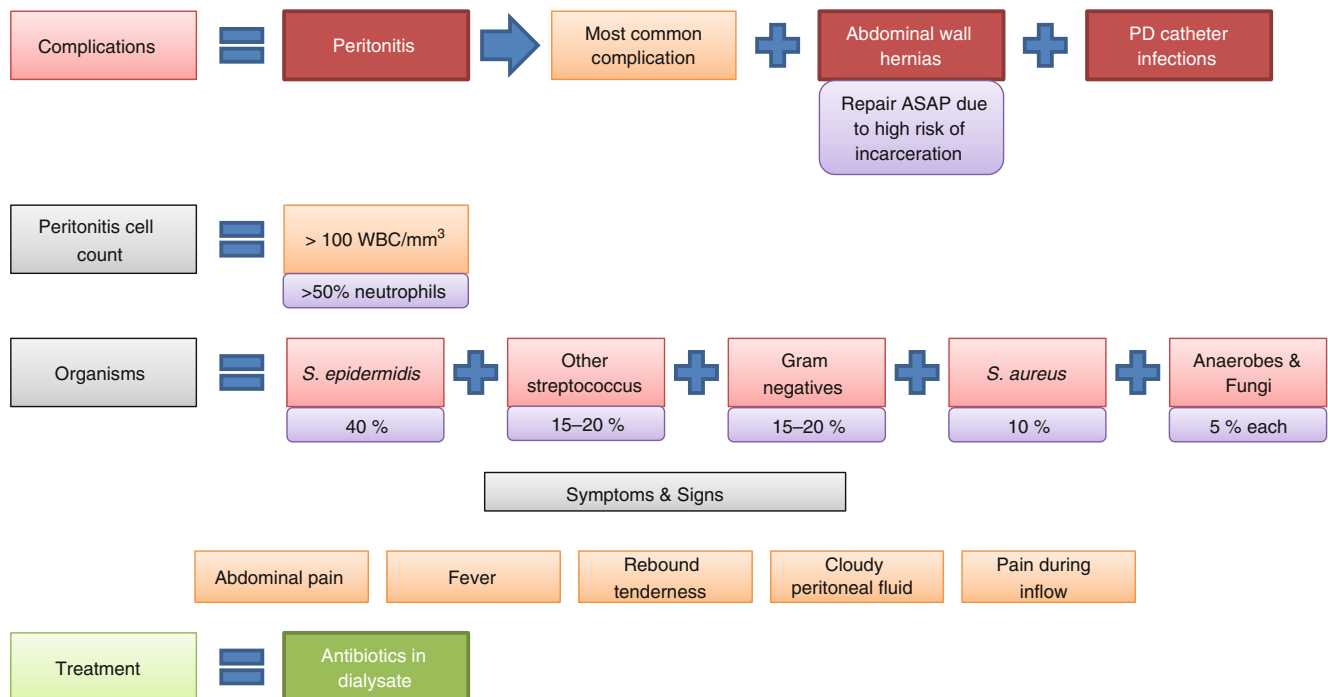
Dialysis Disequilibrium



Altered Mental Status in Hemodialysis Patients

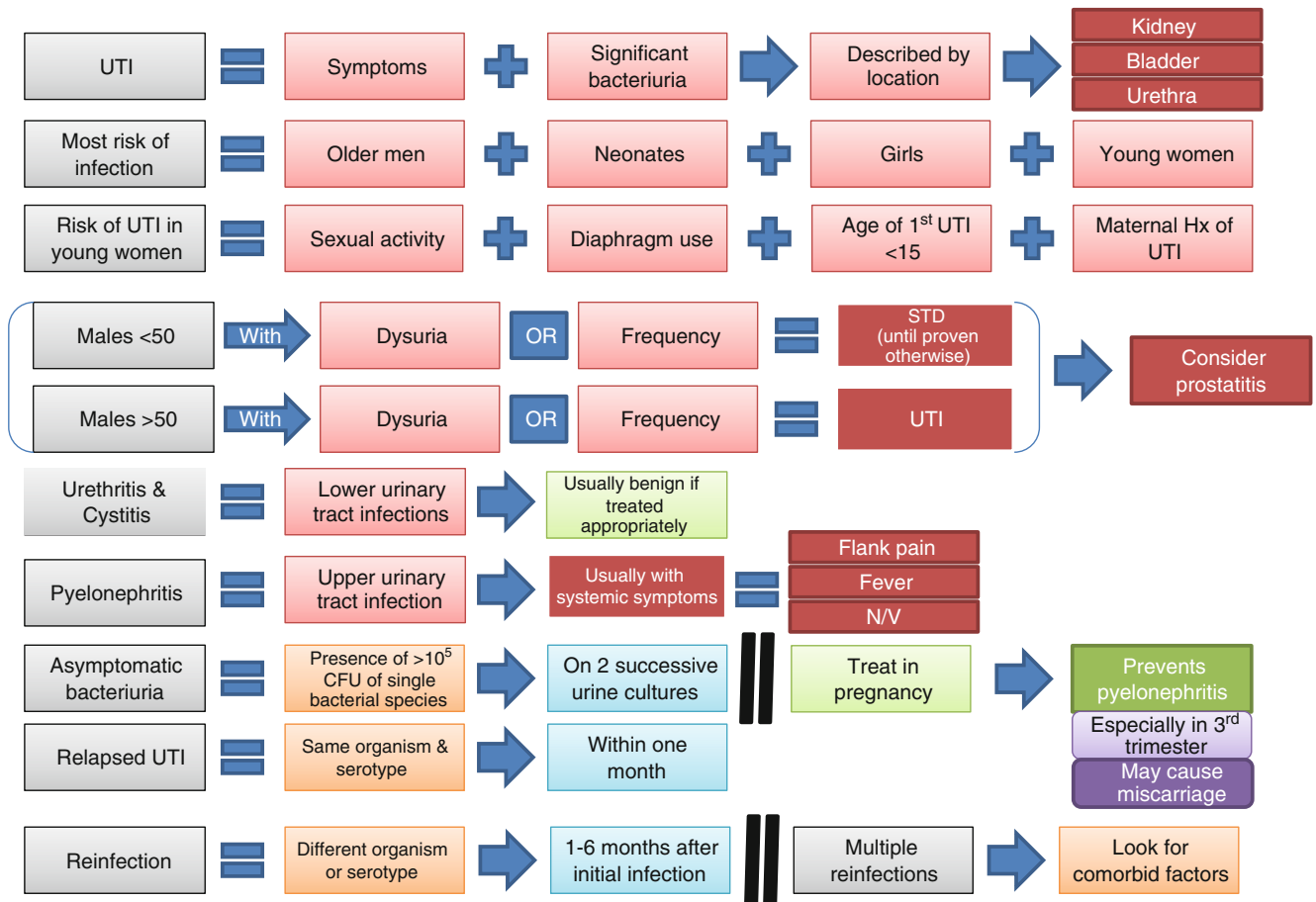


Peritoneal Dialysis

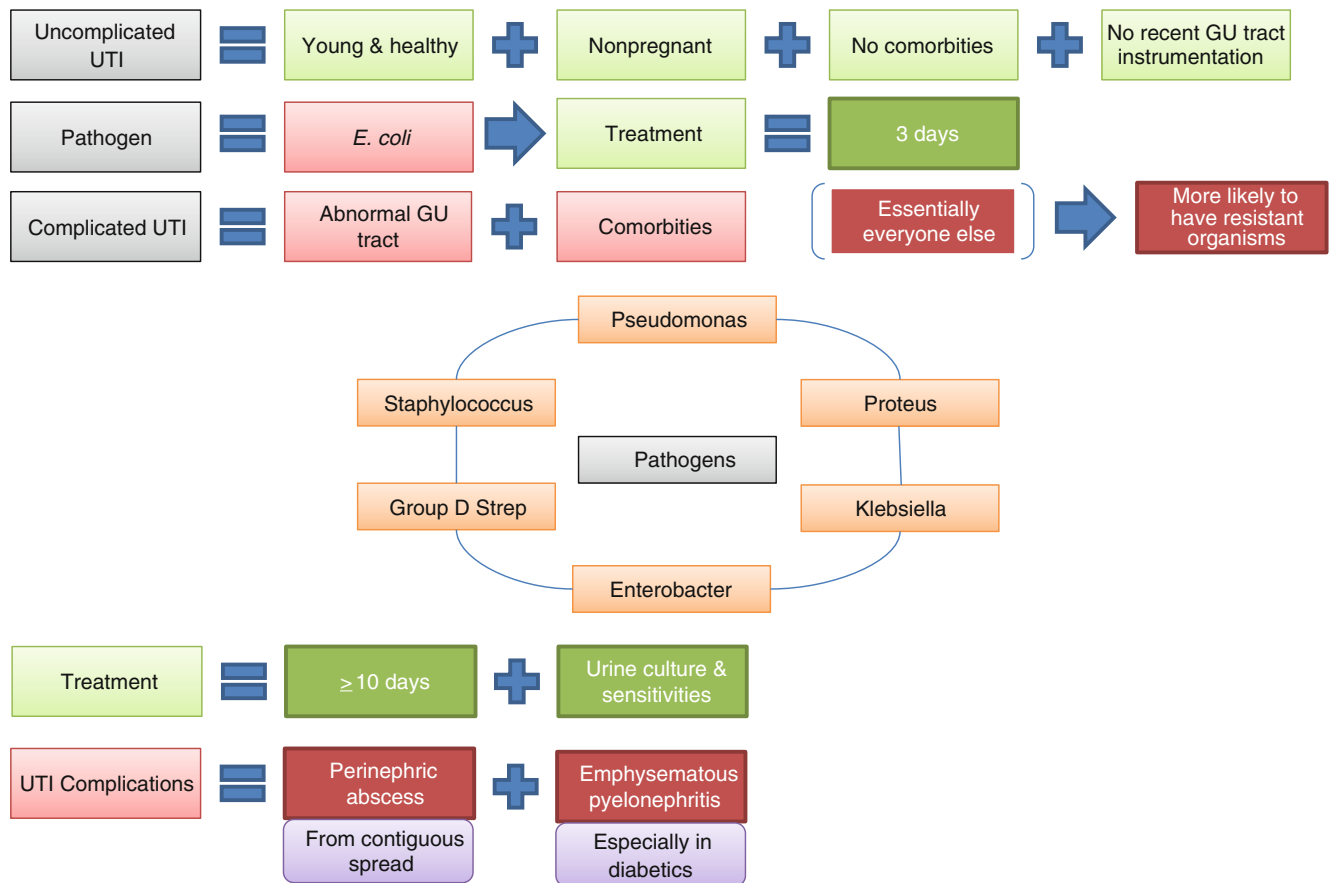


Urinary Tract Infections

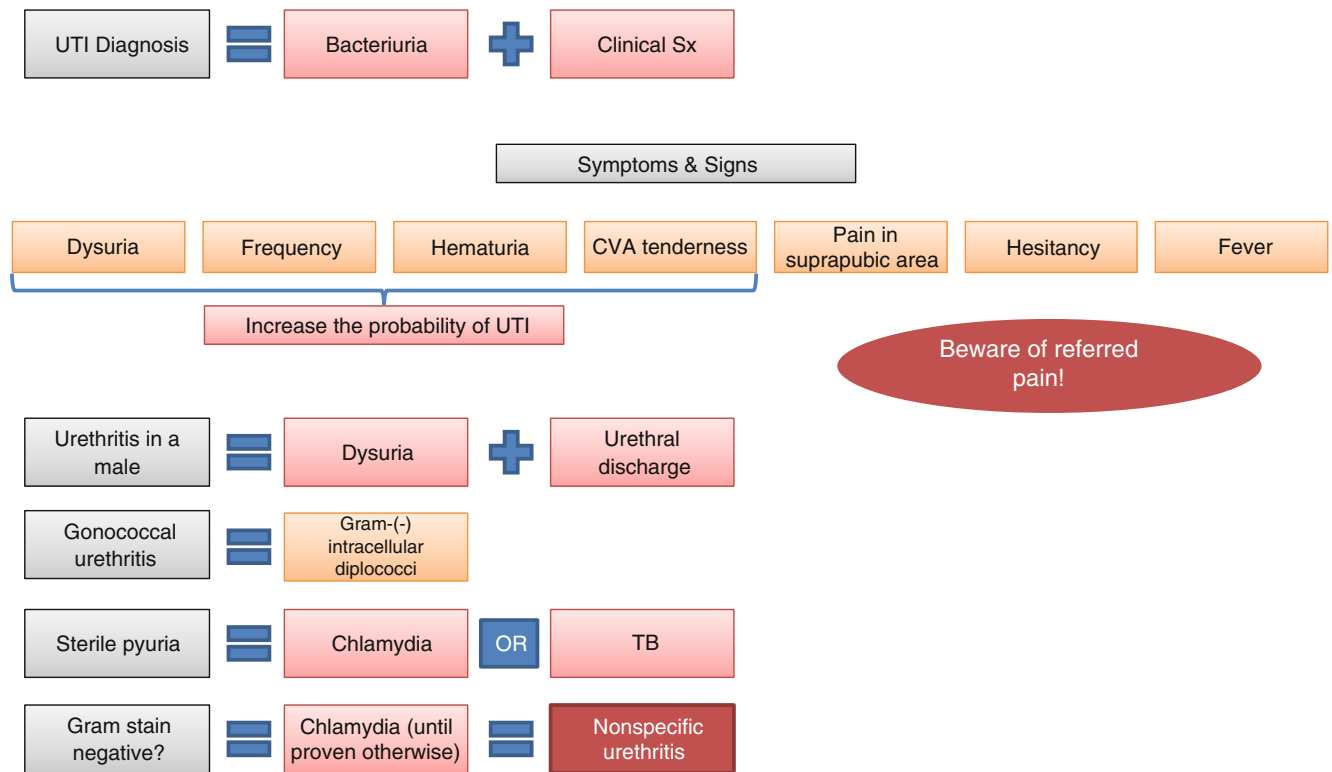
UTI



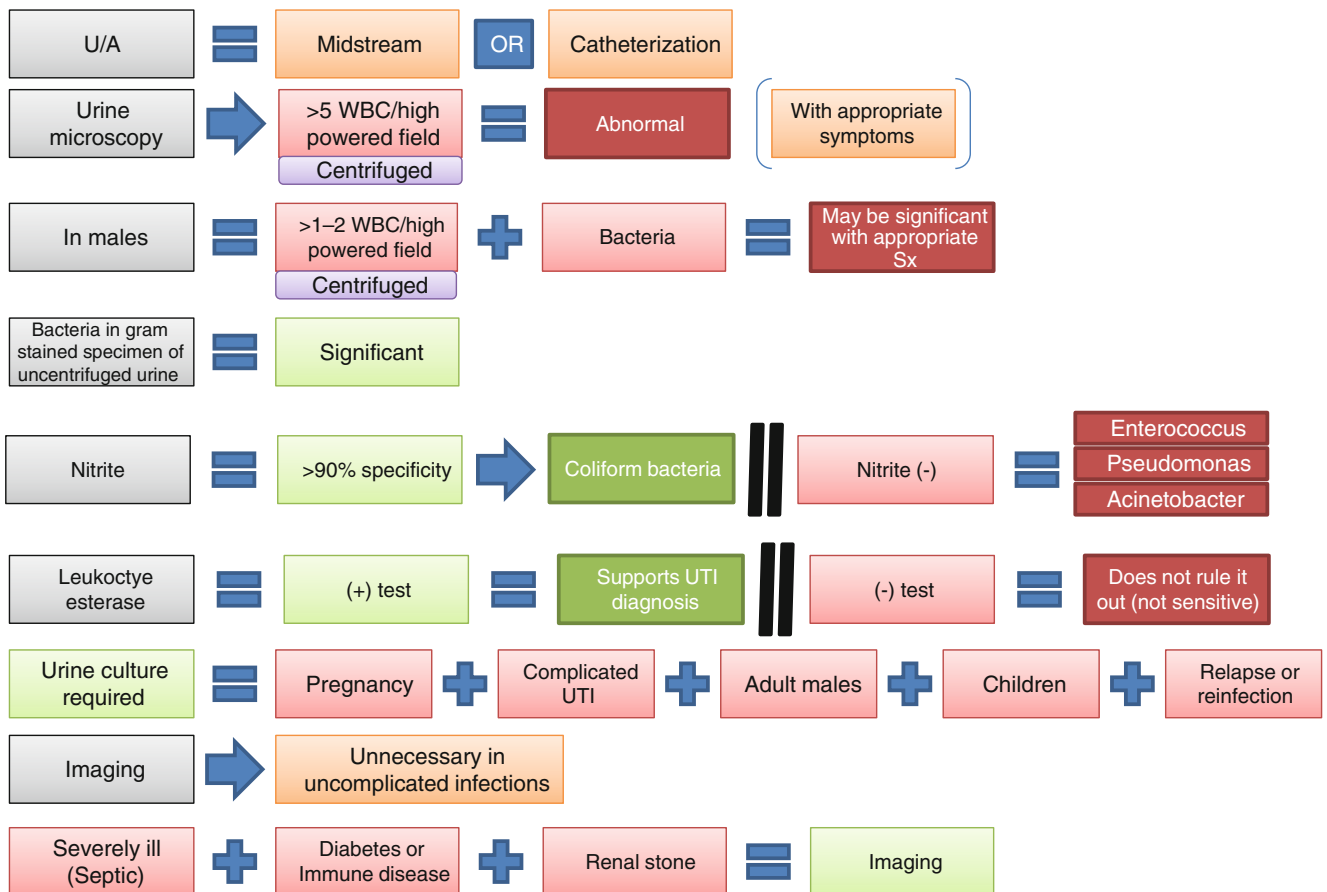
Complicated Versus Uncomplicated UTI



Clinical Features of UTI

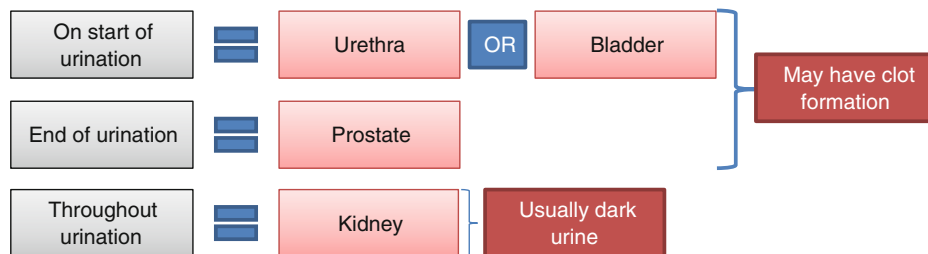
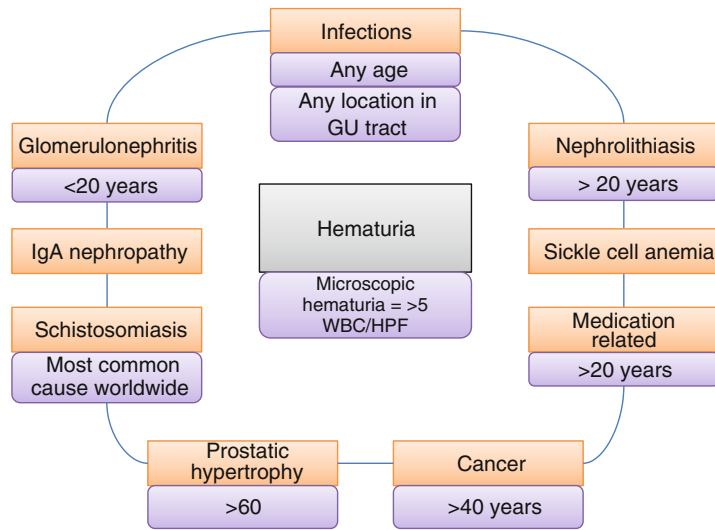


UTI Diagnosis



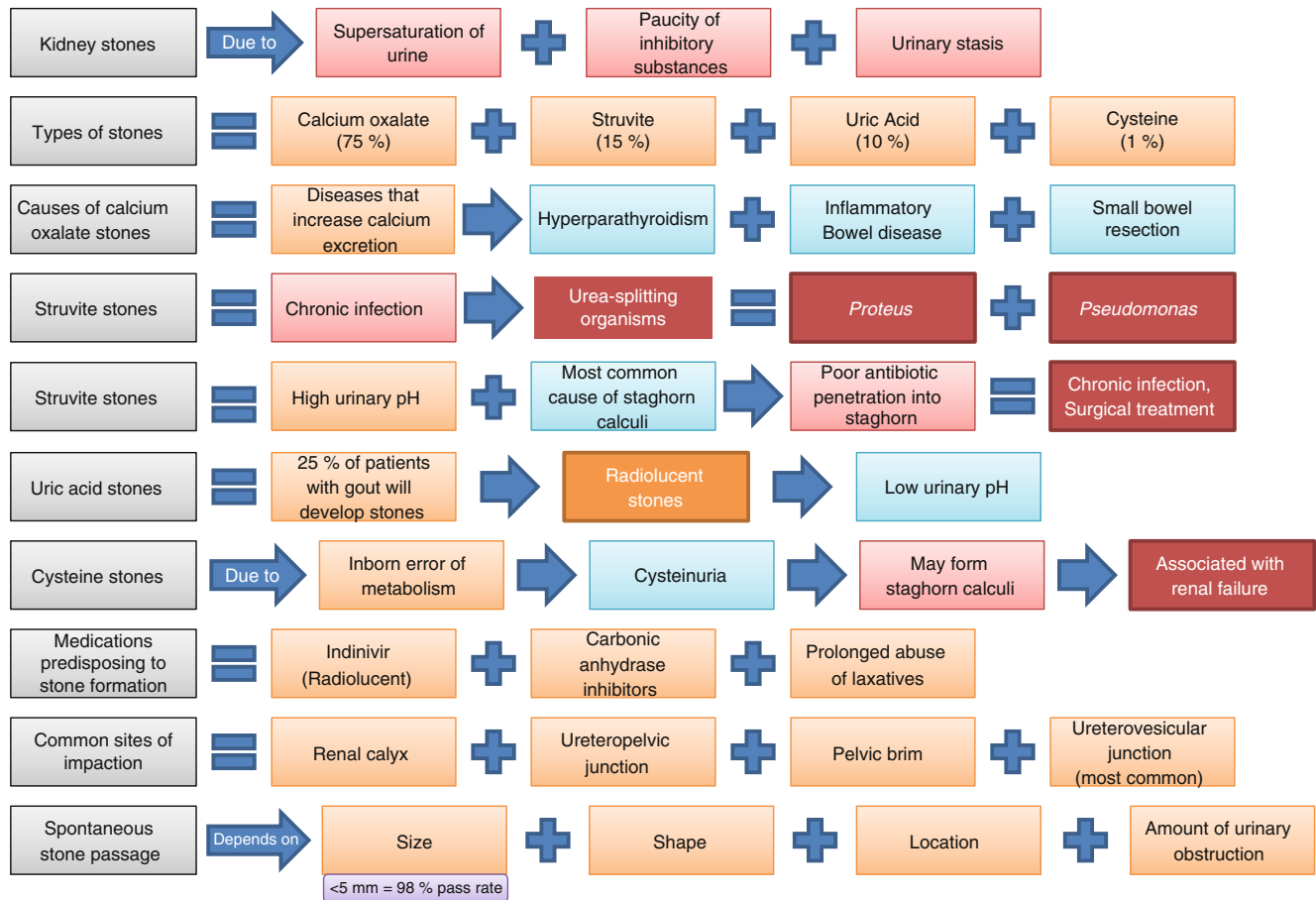
Hematuria

Most Common Causes of Hematuria

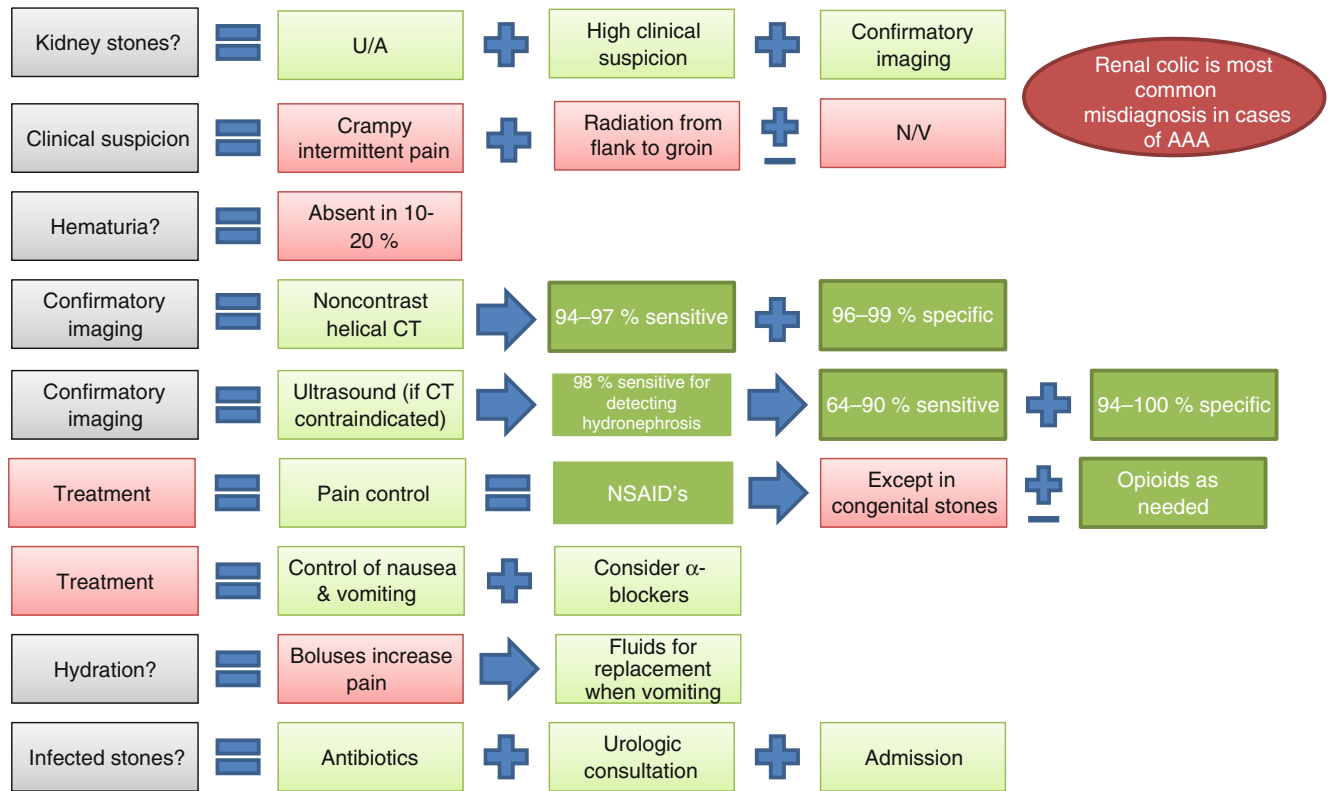


Kidney Stones

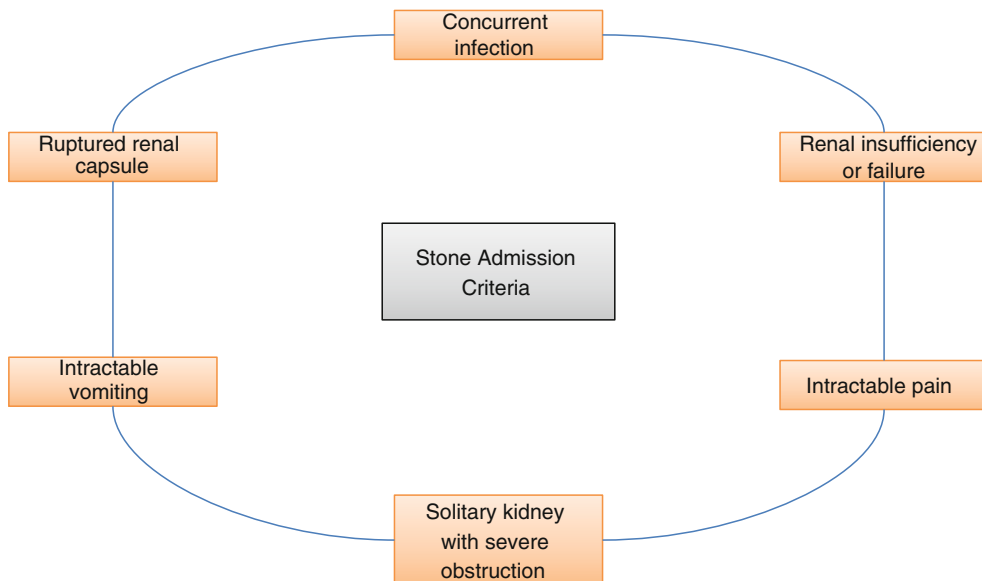
Kidney Stones Diagnosis and Treatment



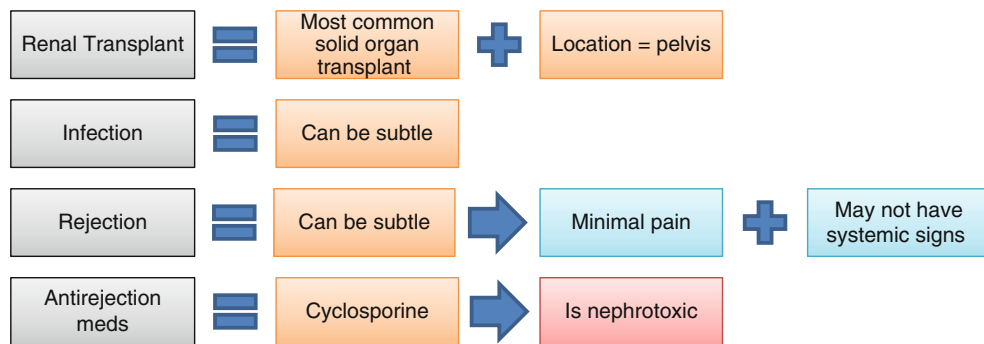
Diagnosis and Treatment



Stone Admission Criteria

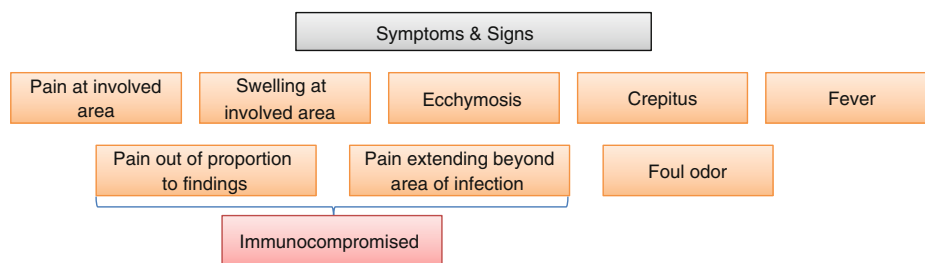
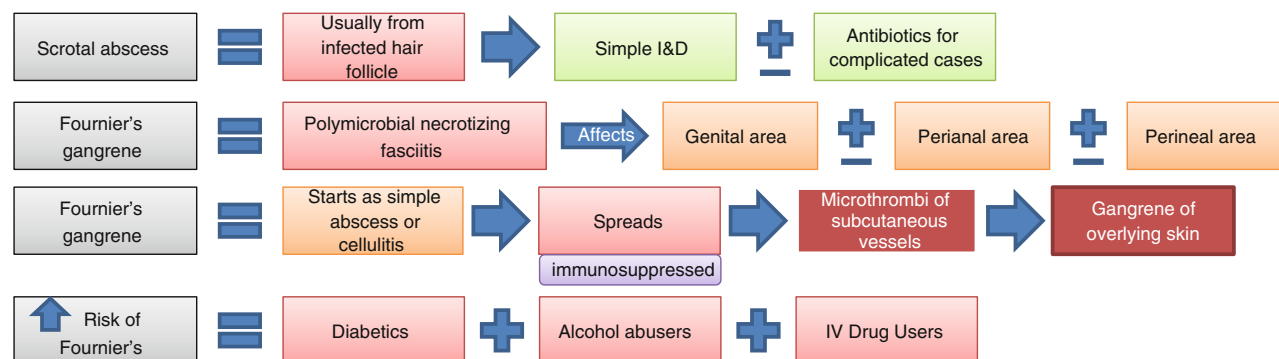


Renal Transplant



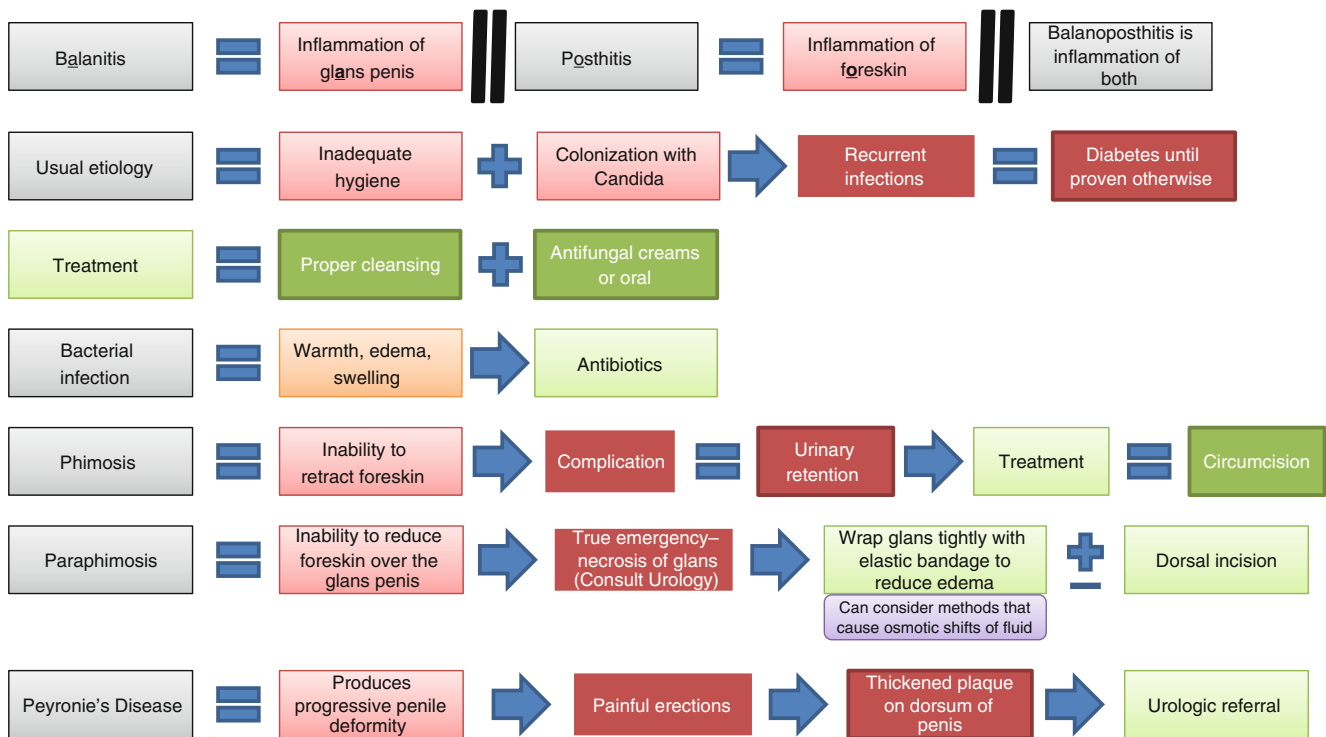
Male Genital Emergencies

Scrotal Disorders

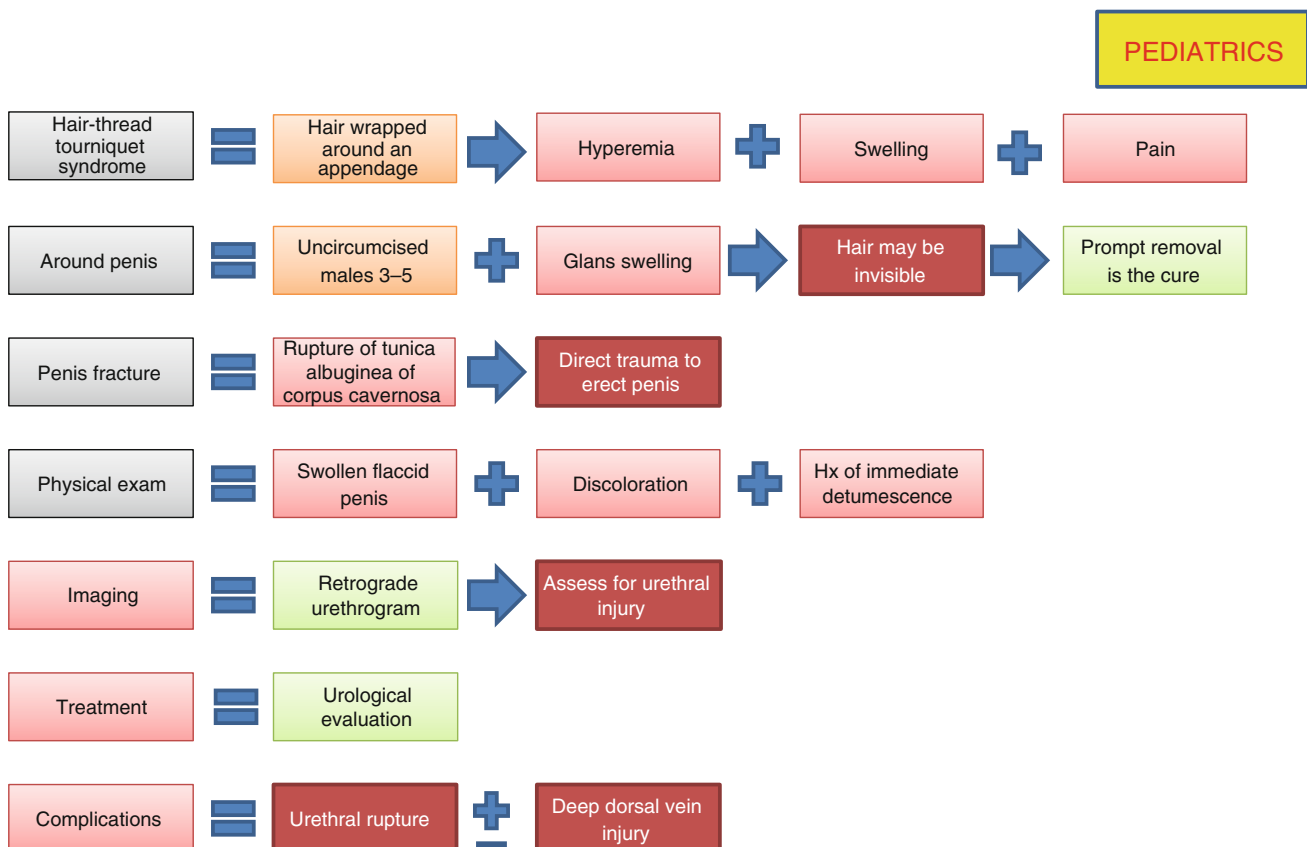


Center right image (Reprinted from Wessells H, Sorensen MD. Fournier's gangrene. In: Wessells H, editor. Urological emergencies: a practical approach. New York: Humana Press; 2013. p. 141–50. With permission from Springer Science + Business Media)

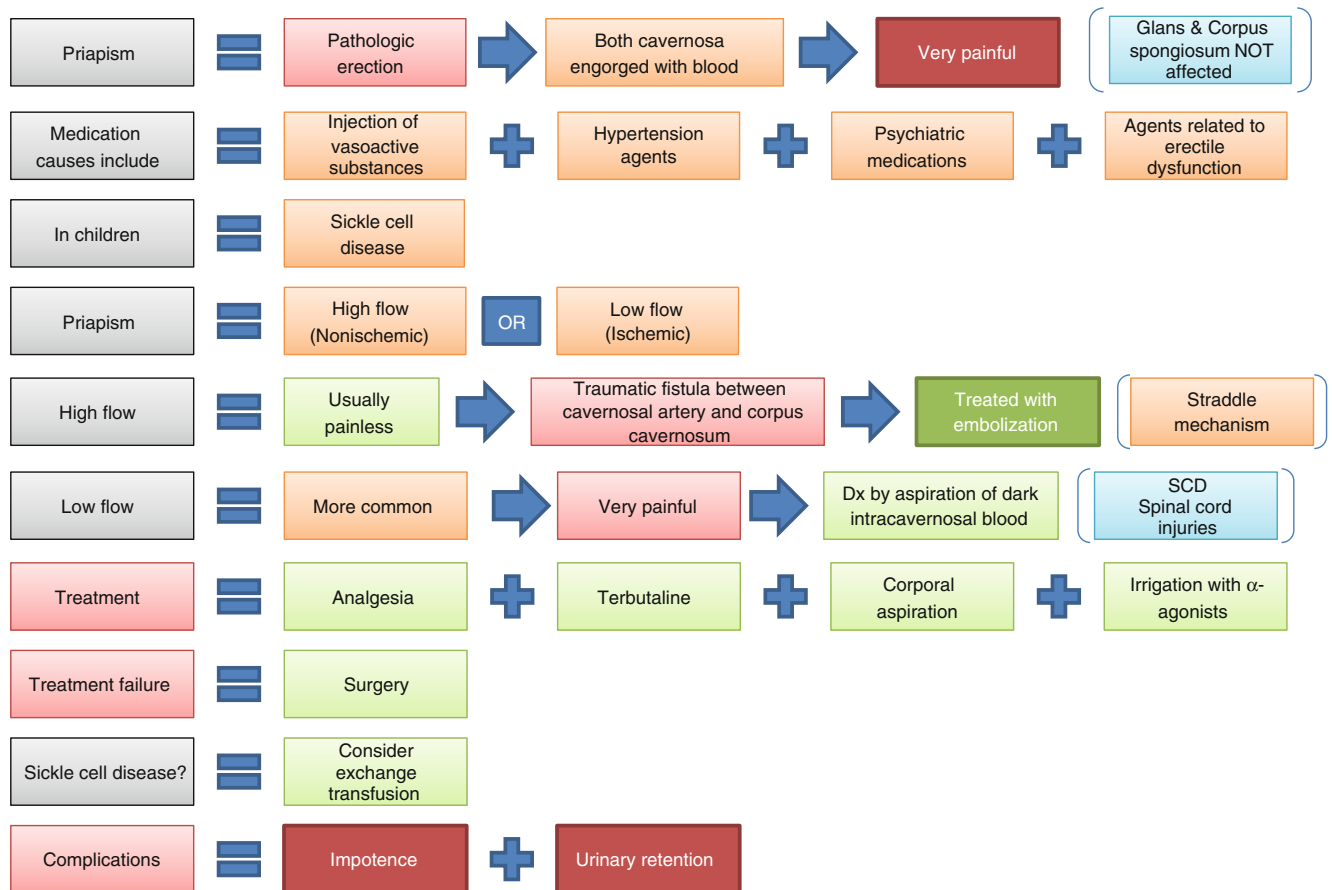
Glans Penis and Foreskin Disorders



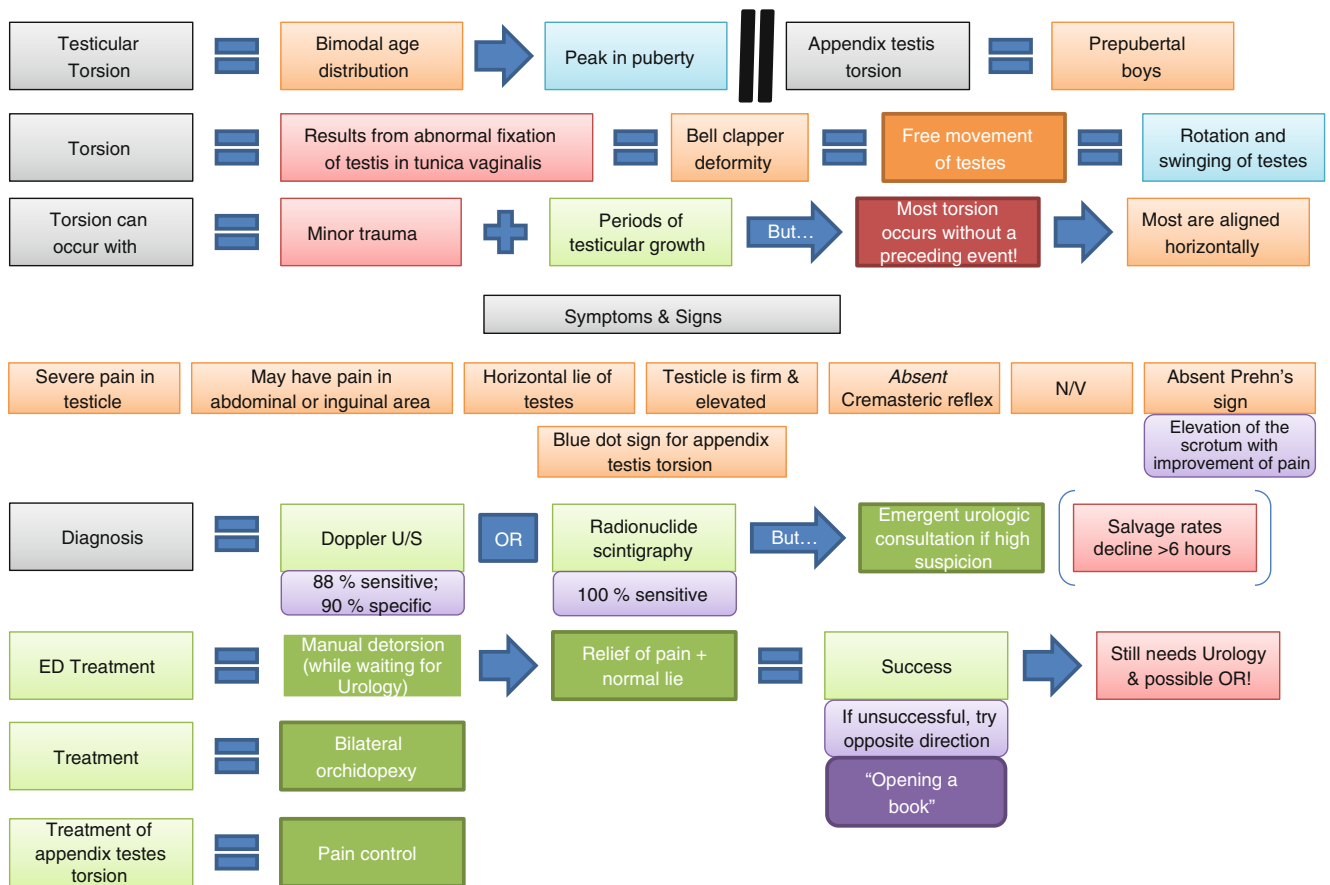
Traumatic Penis and Foreskin Disorders



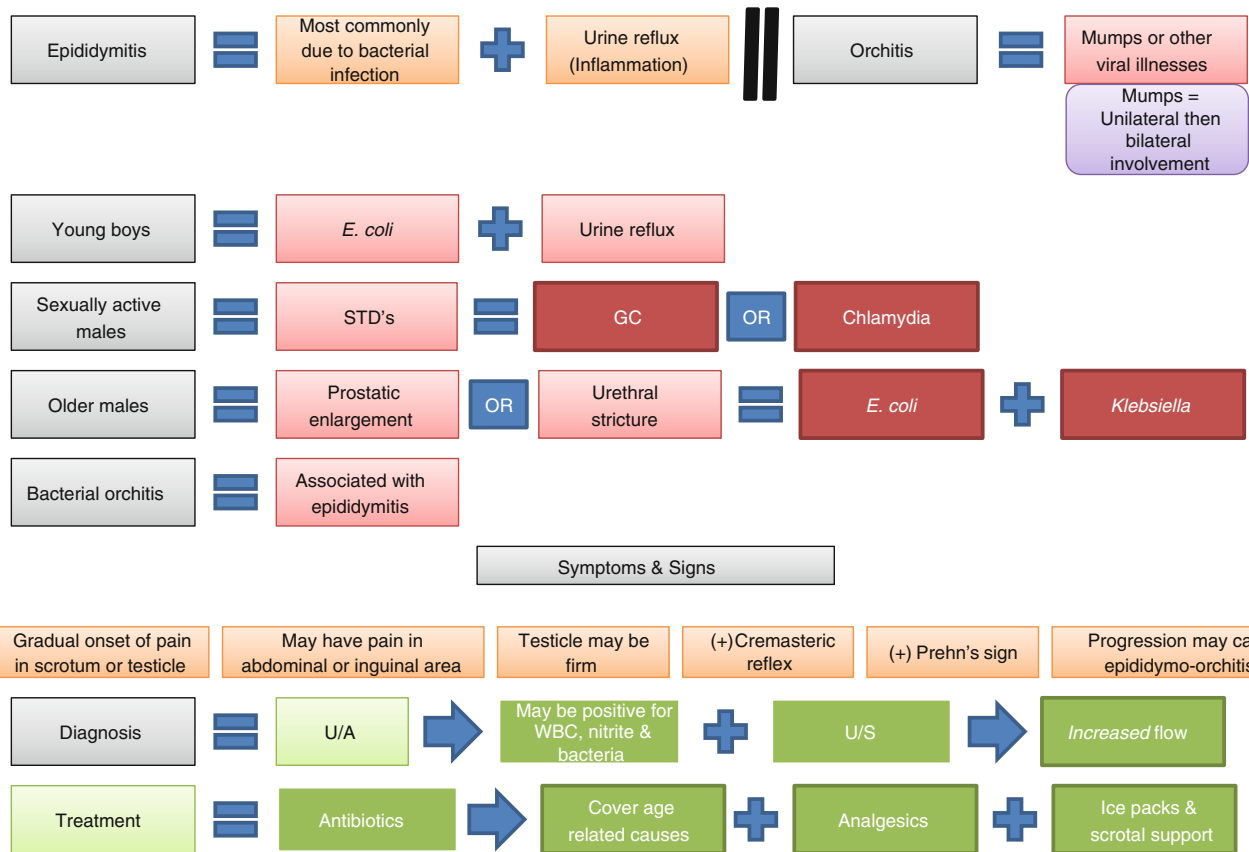
Priapism



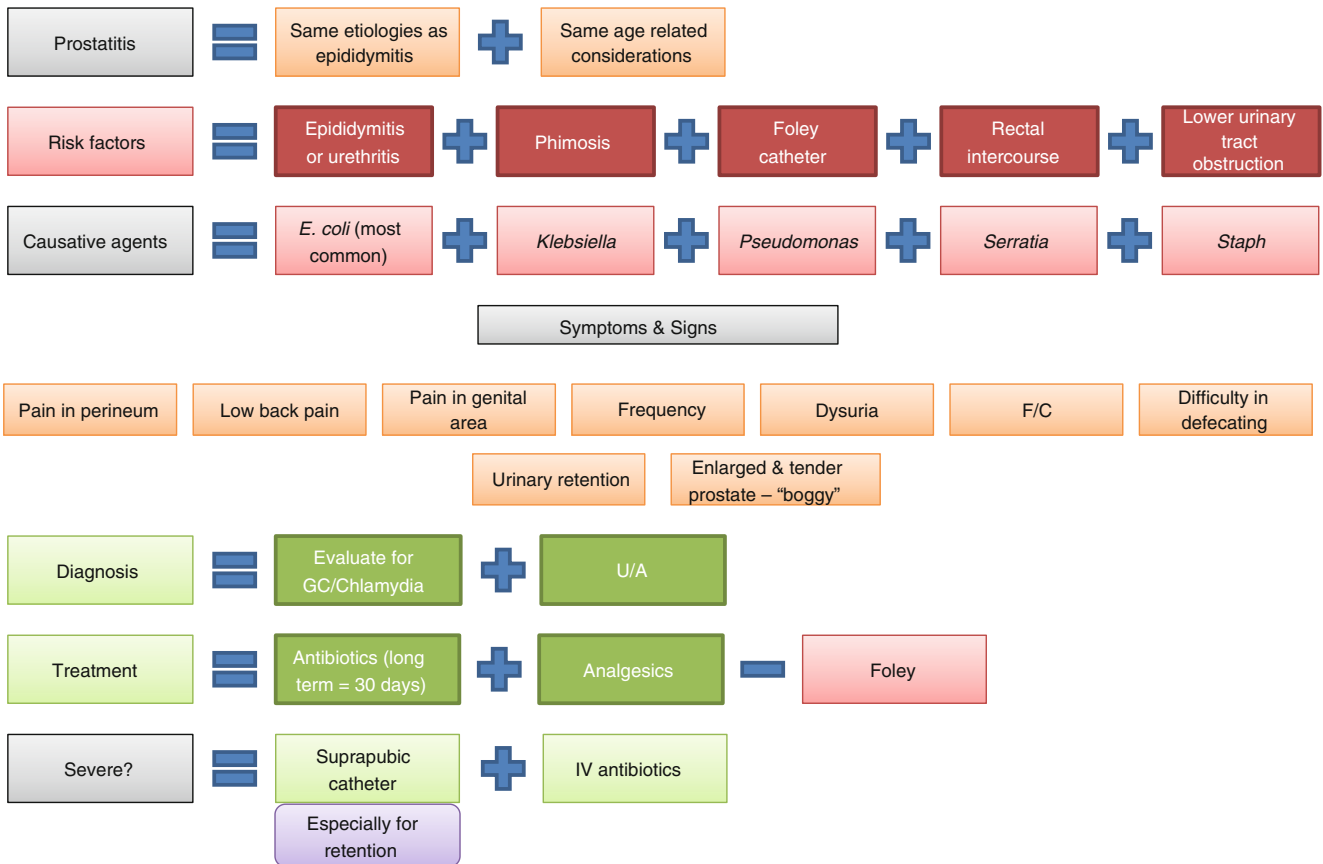
Testicular Torsion



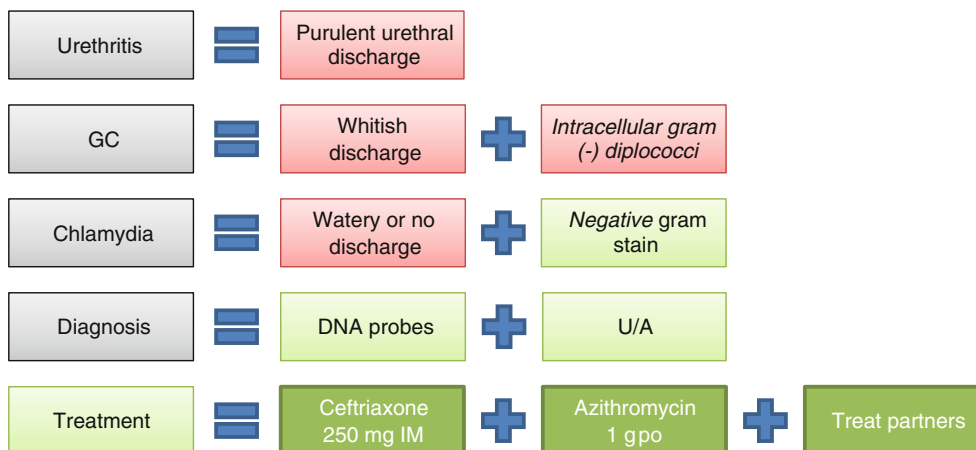
Epididymitis and Orchitis



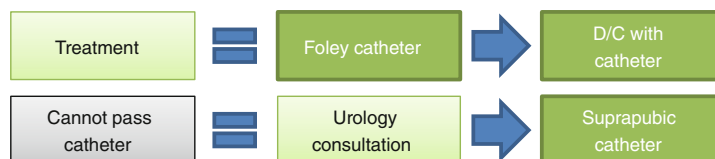
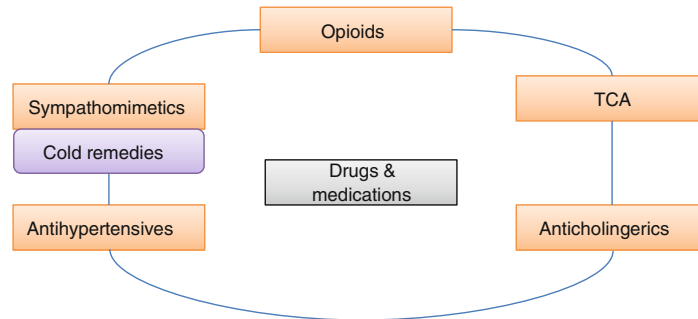
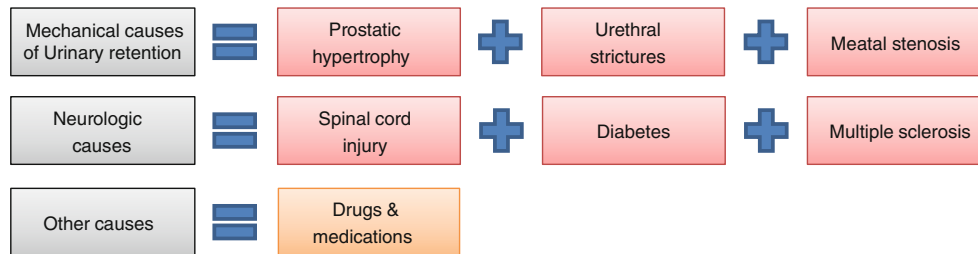
Prostatitis



Urethritis

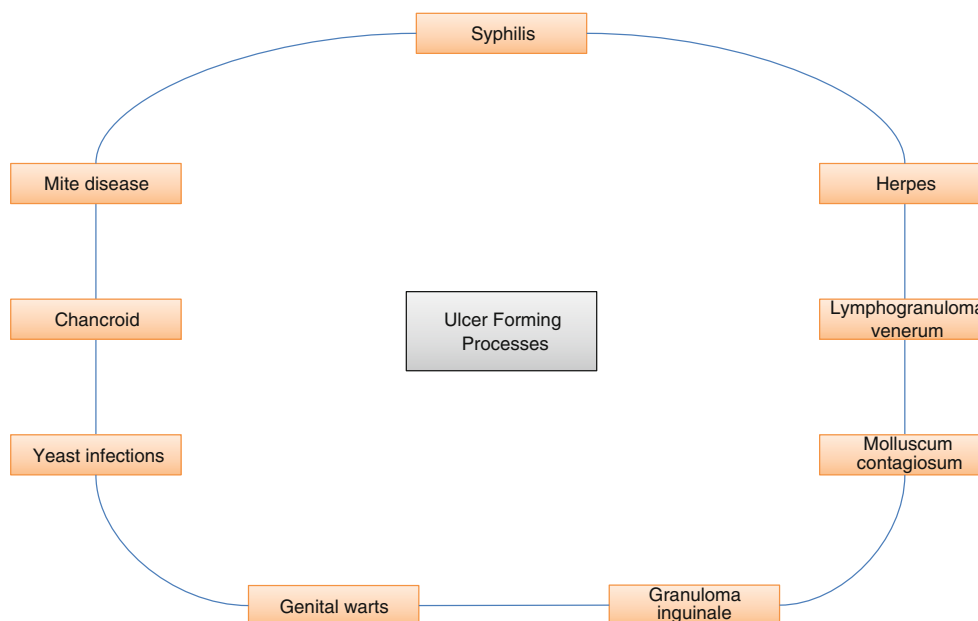


Urinary Retention

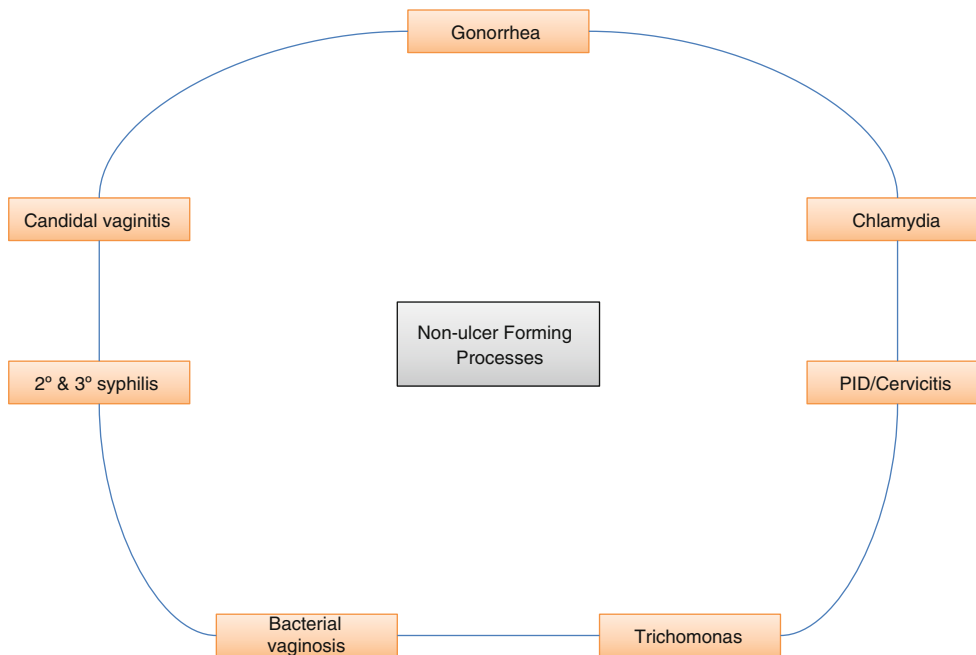


Sexually Transmitted Diseases

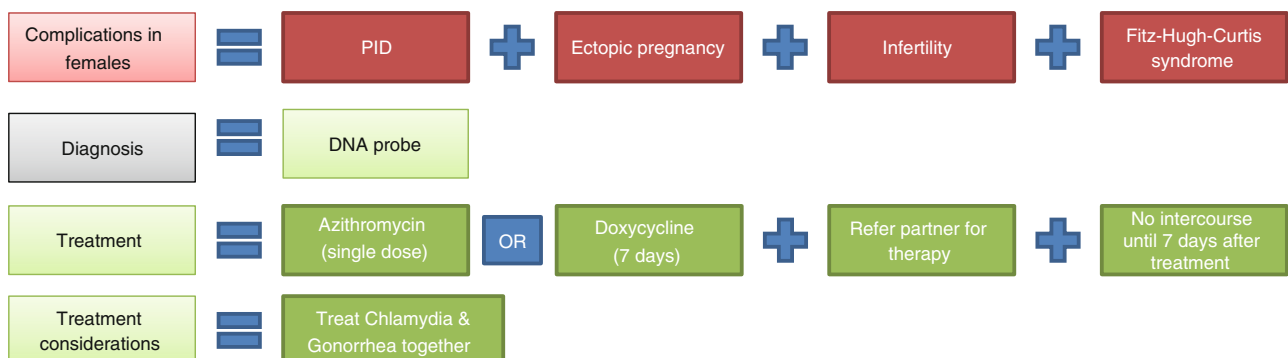
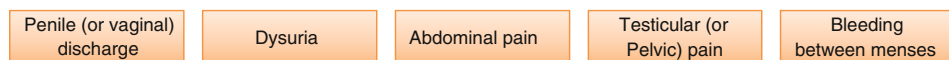
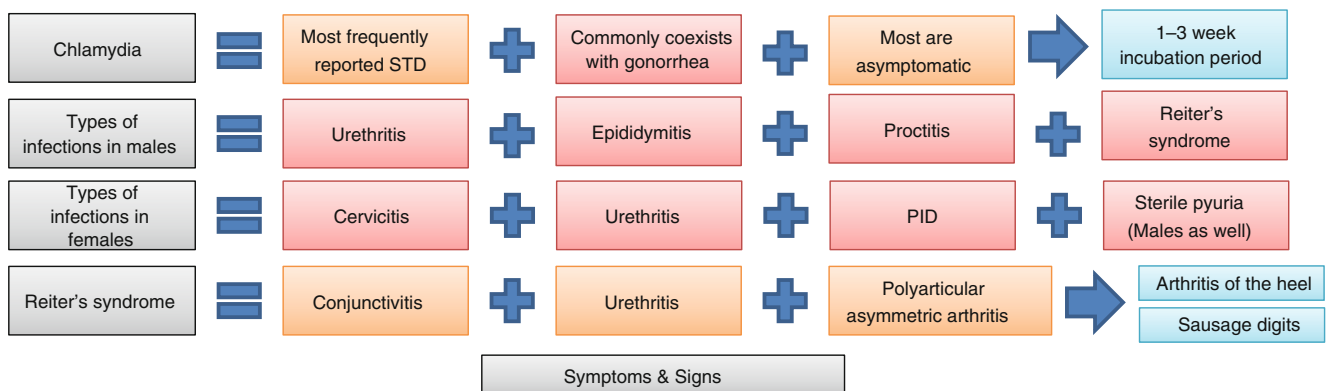
Ulcer-Forming Processes



Non-ulcer-Forming Processes



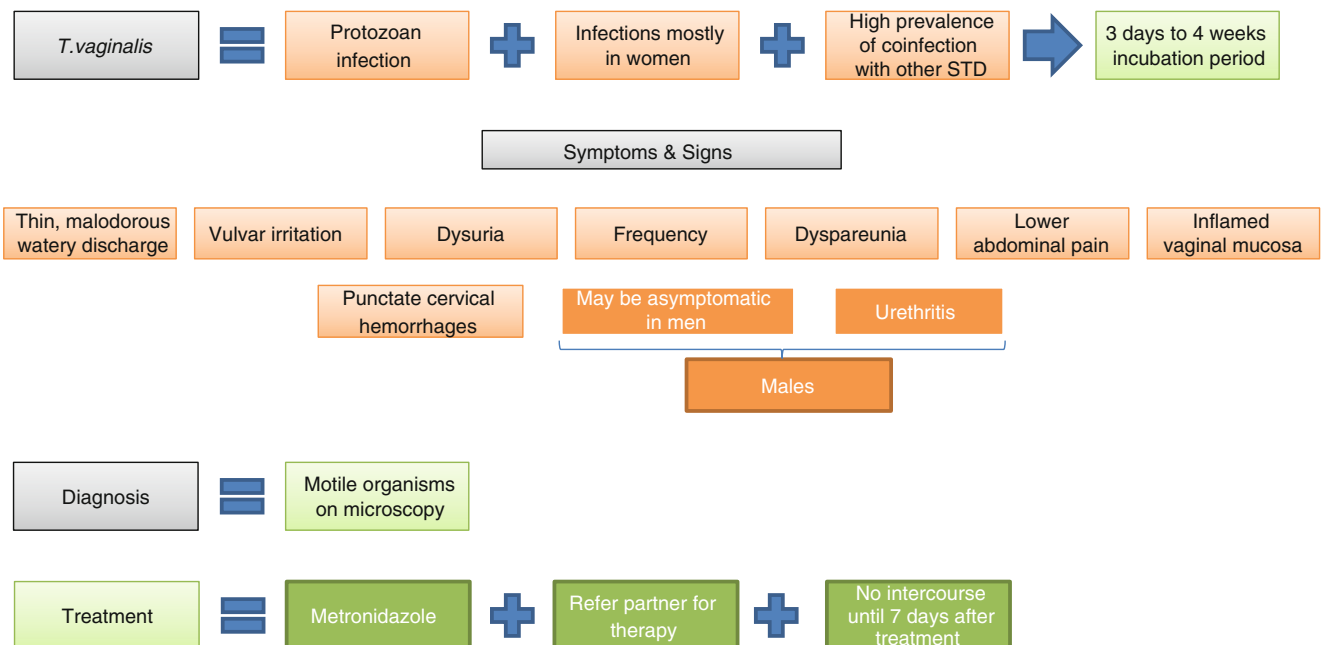
Chlamydia



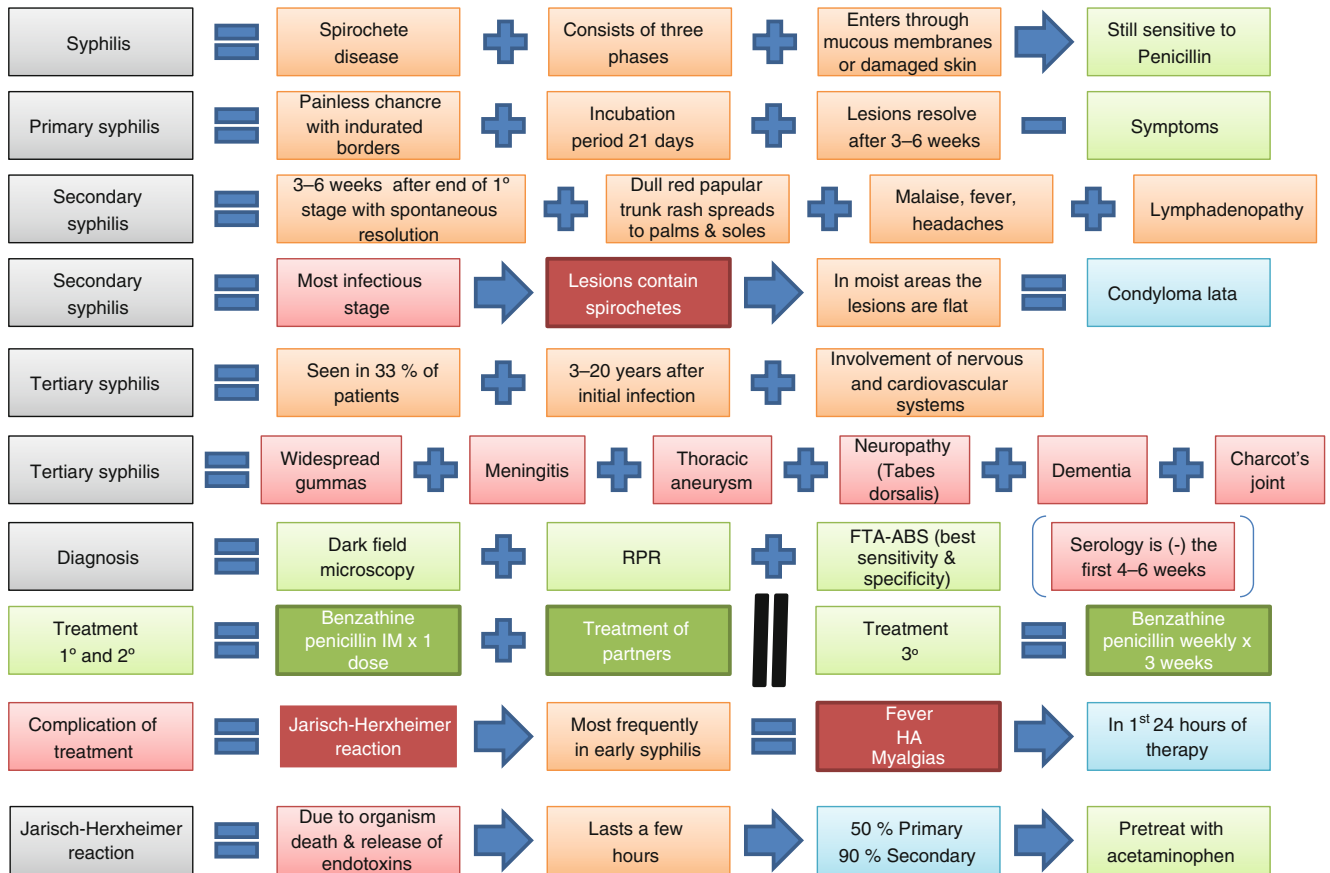
Gonorrhea



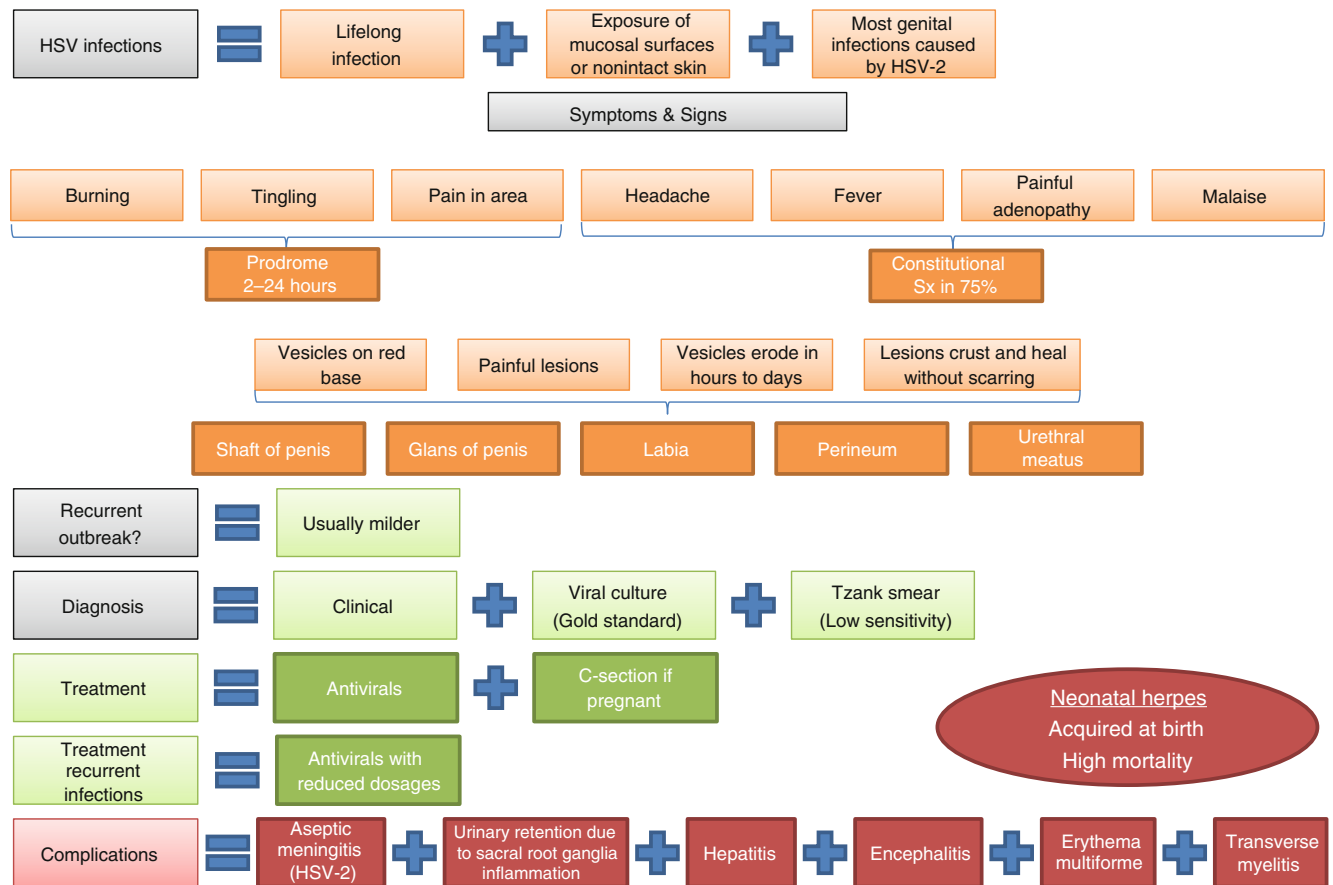
Trichomoniasis



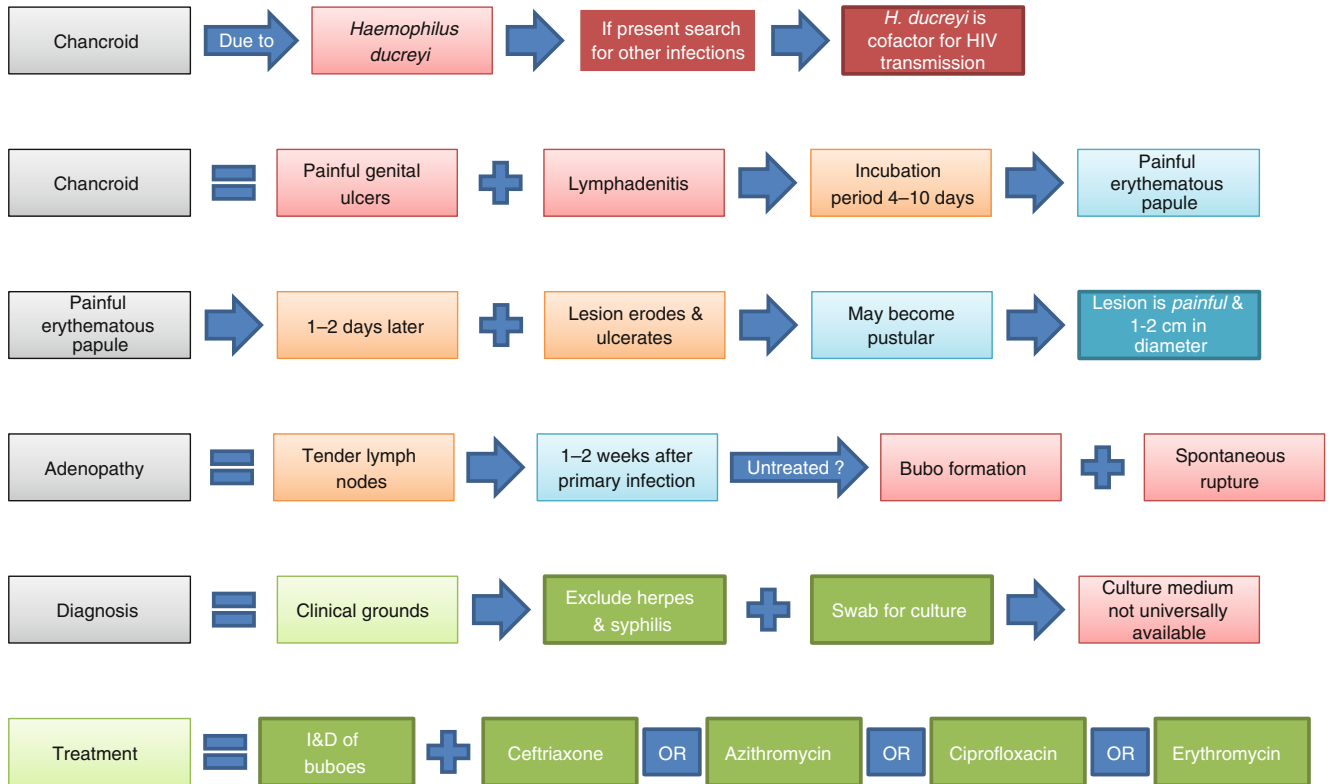
Syphilis



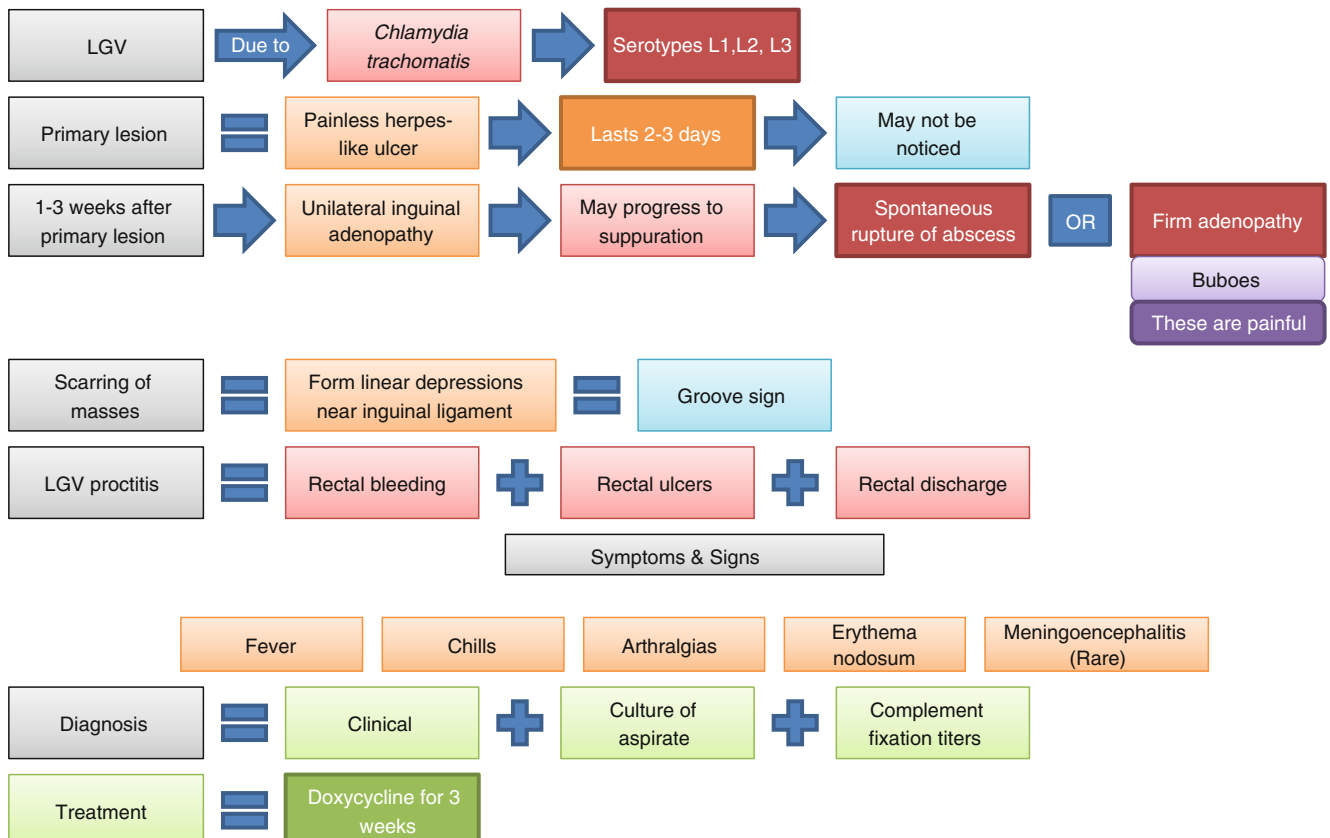
Herpes Simplex



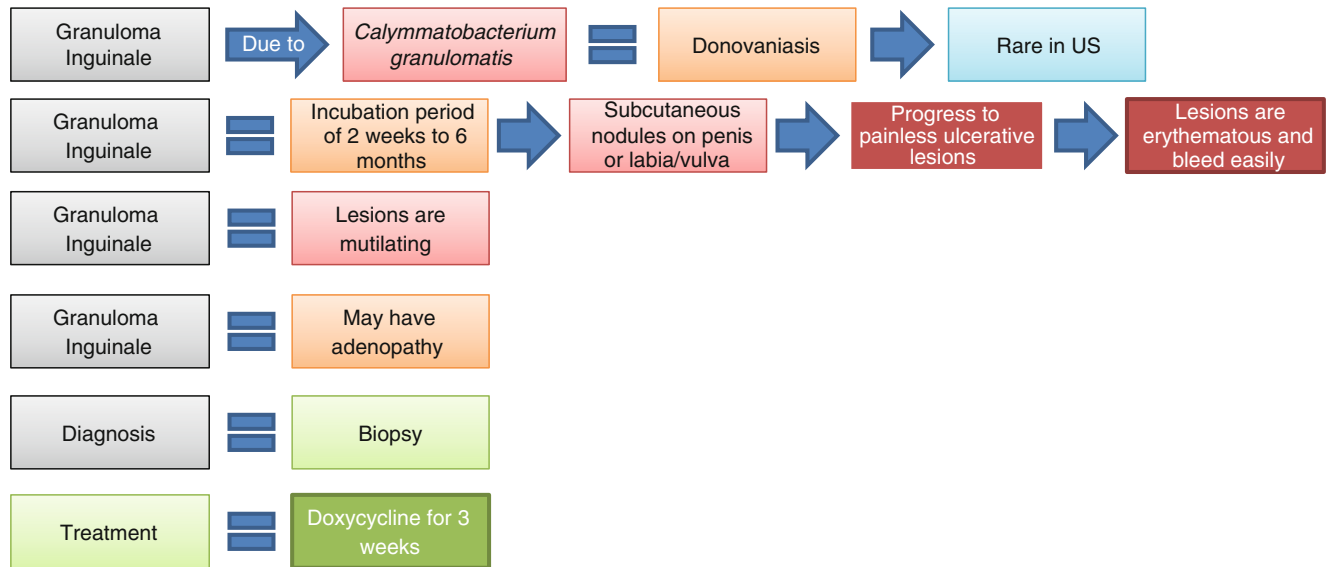
Chancroid



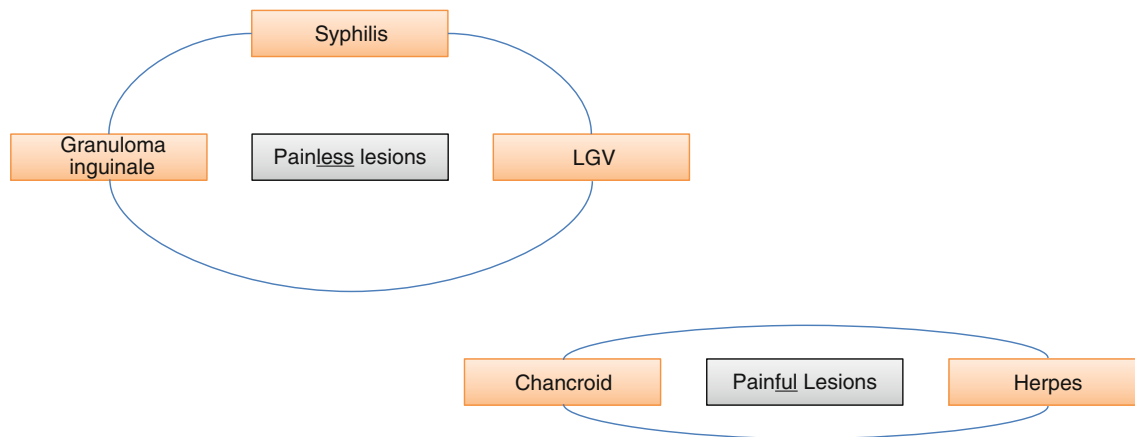
Lymphogranuloma Venereum (LGV)



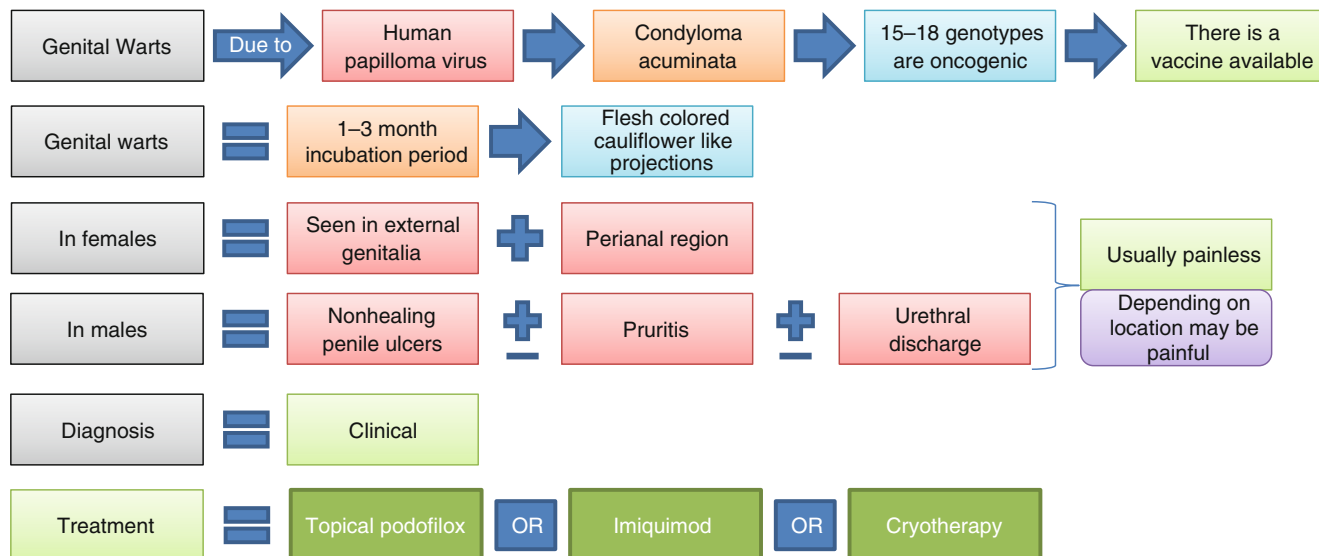
Granuloma Inguinale



Lesions



Genital Warts



Hematologic and Oncologic Emergencies

Bobby Desai

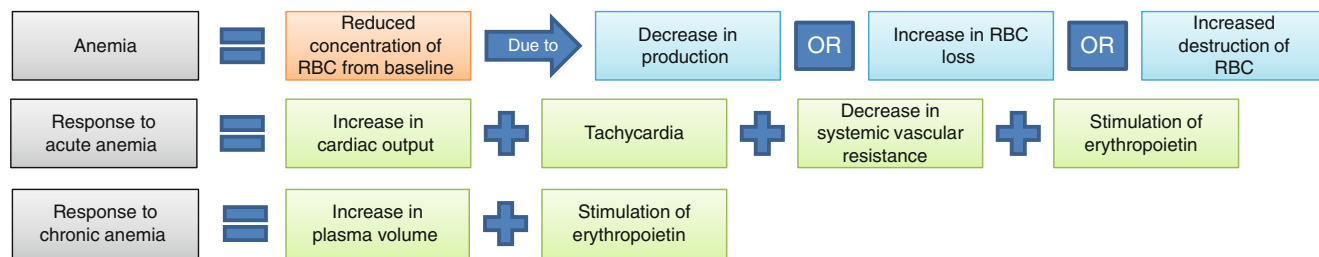
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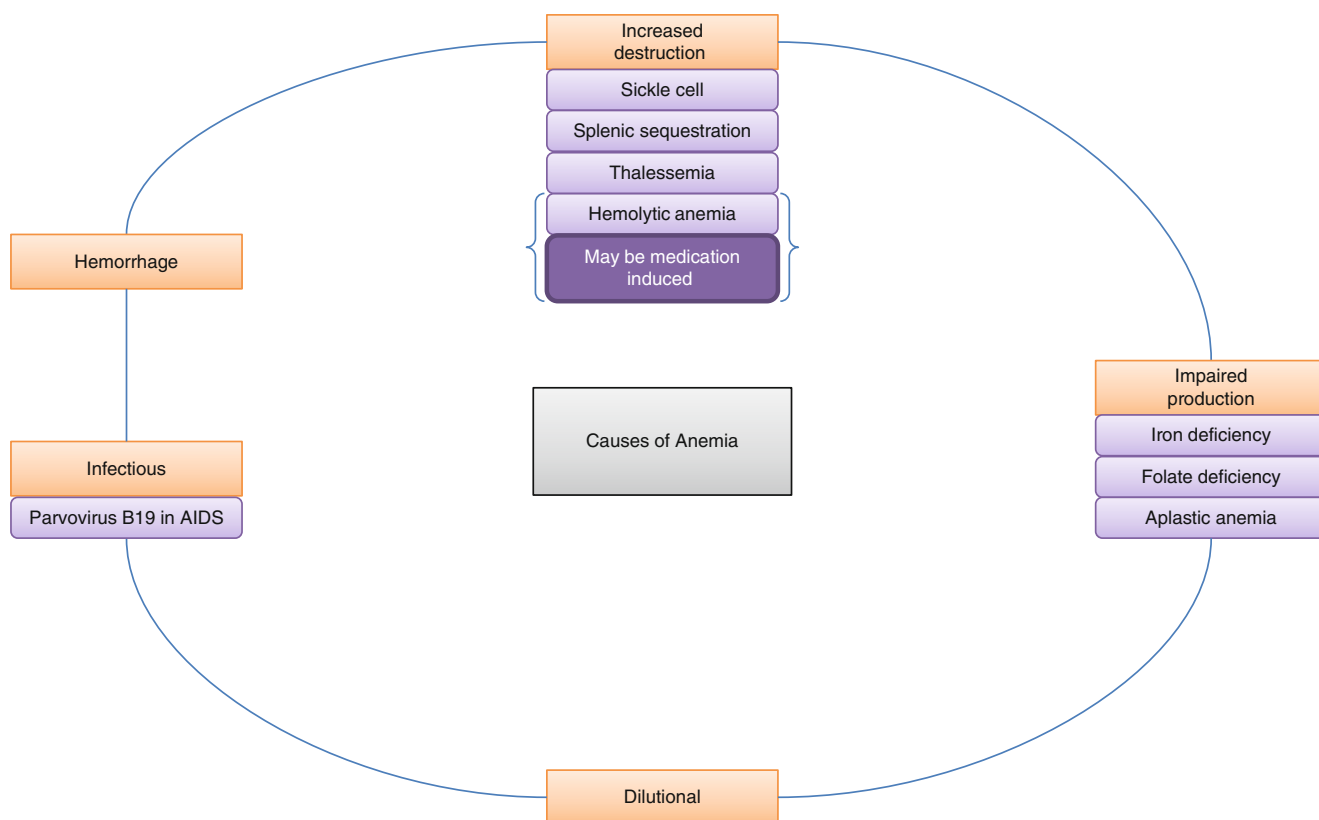
B. Desai, MD, MEd
Department of Emergency Medicine, University of Florida,
Gainesville, FL, USA
e-mail: bdesai@ufl.edu

Anemia

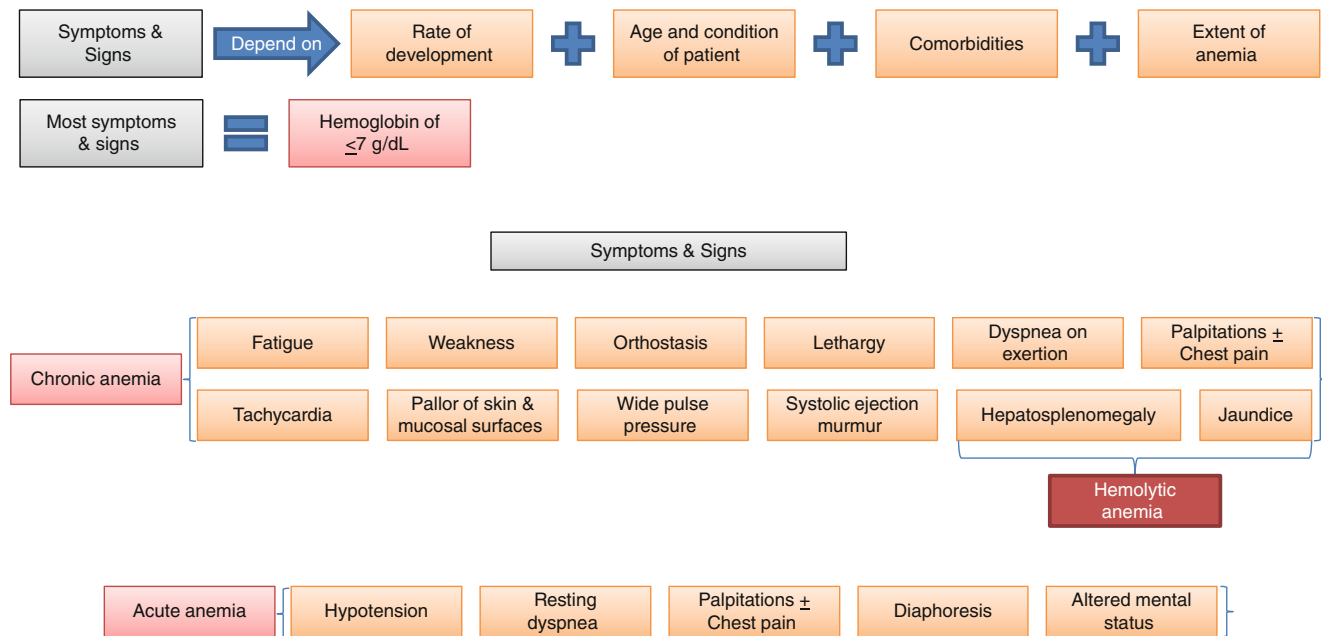
Introduction



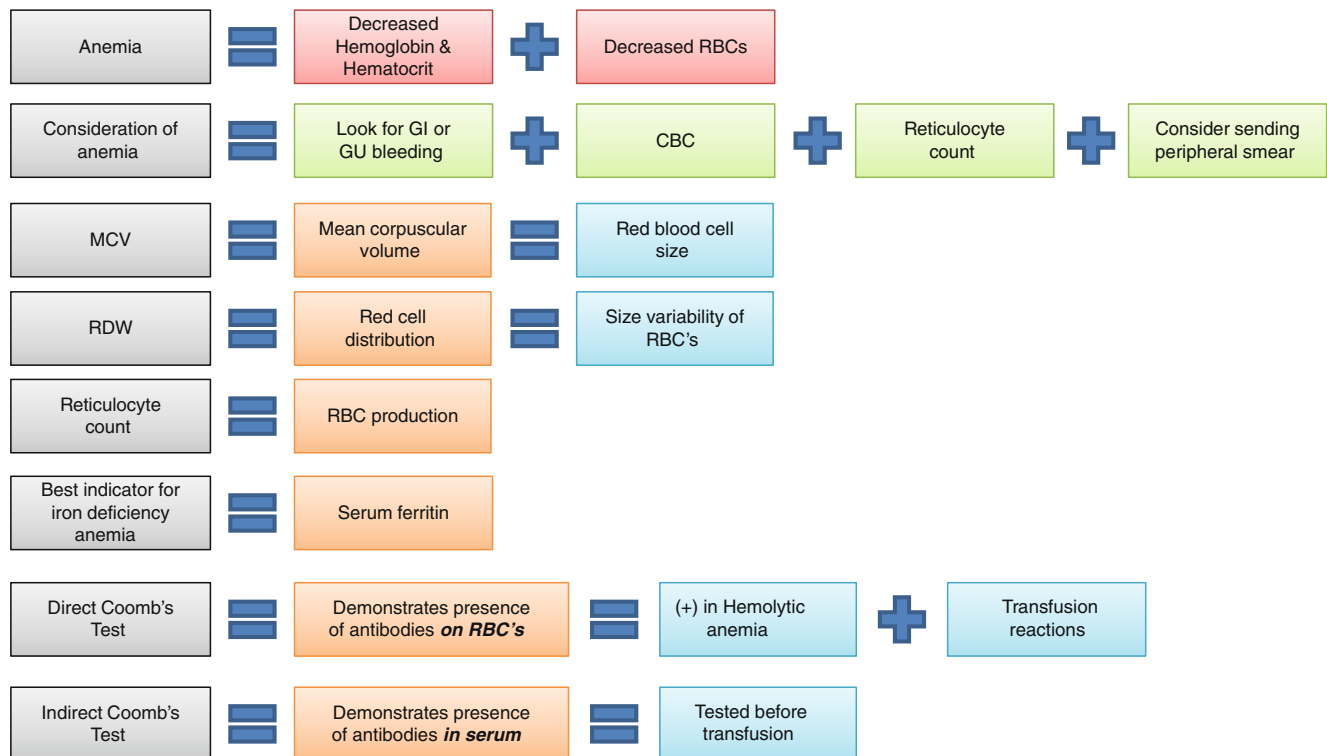
Causes of Anemia



Symptoms and Signs



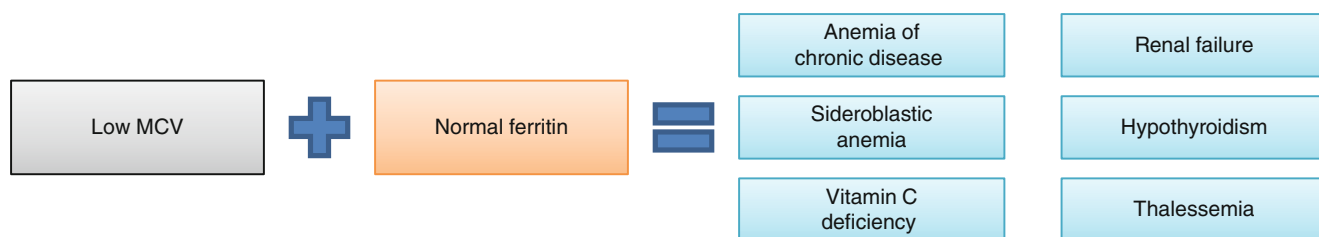
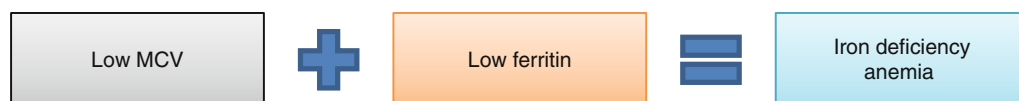
Specific Labs for Anemia



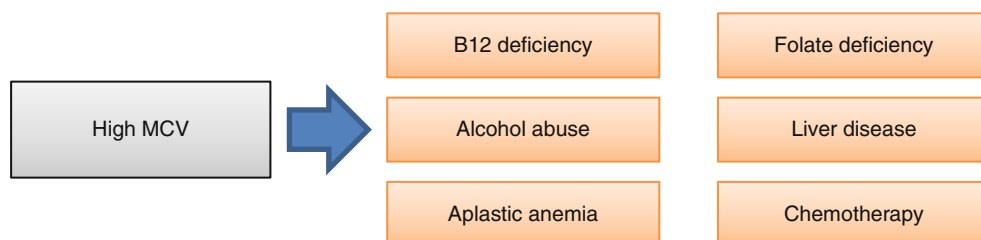
Classification of Anemia

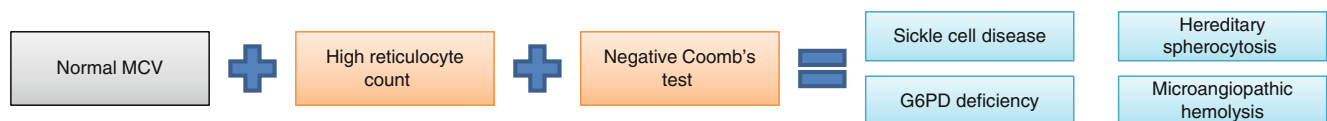
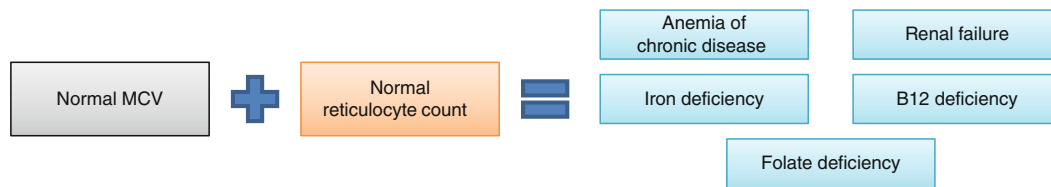
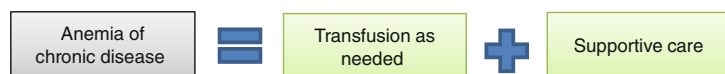
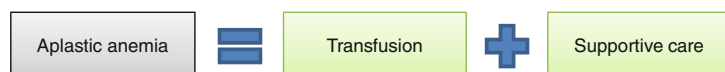
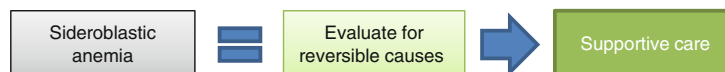
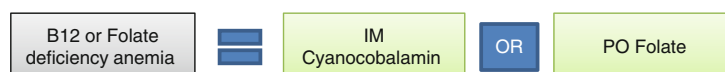
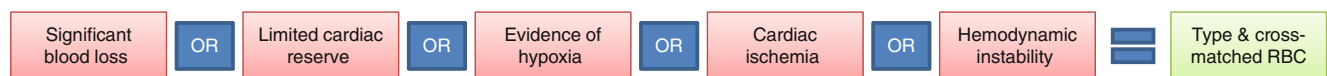


Low MCV (Microcytic)



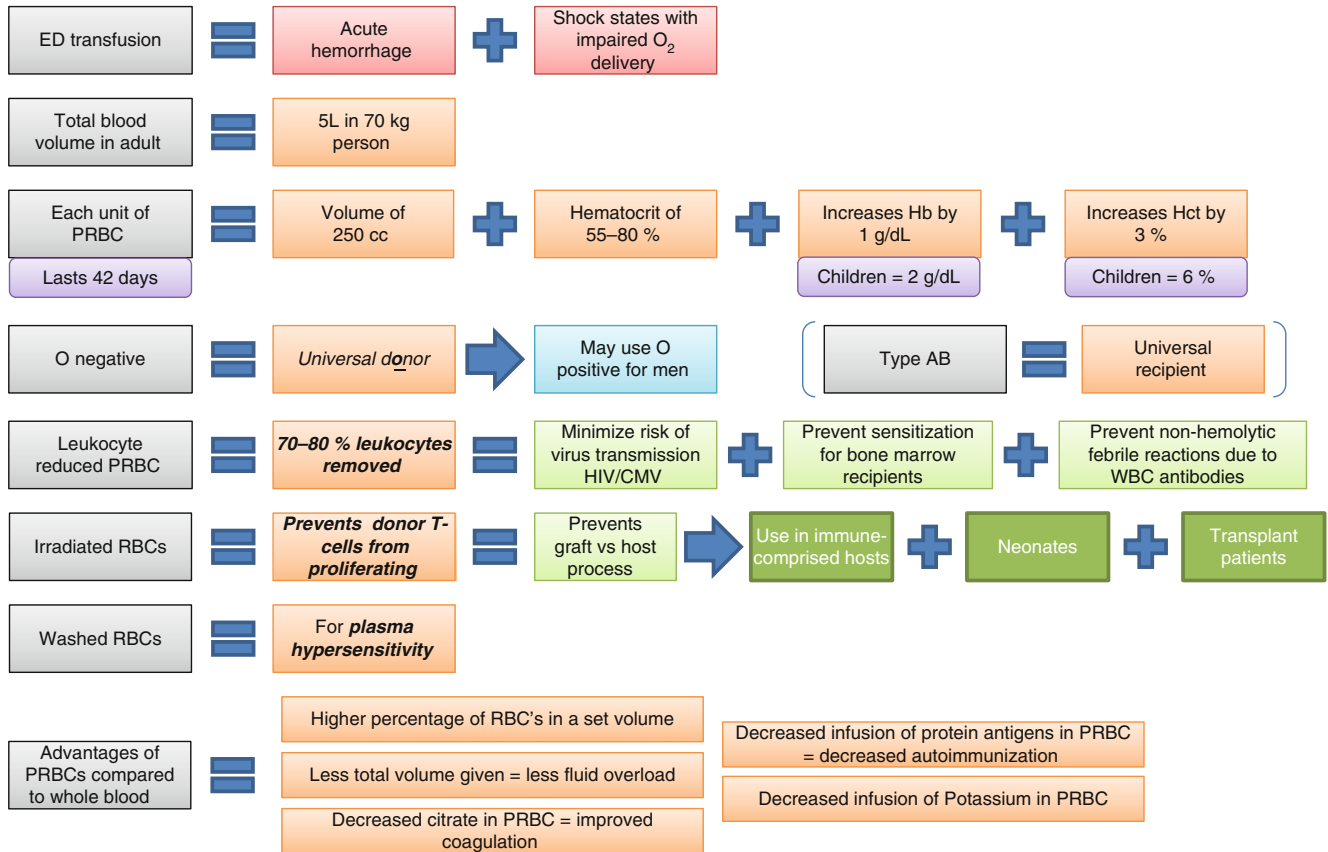
High MCV (Macrocytic)



Normal MCV (Normocytic)**Treatment**

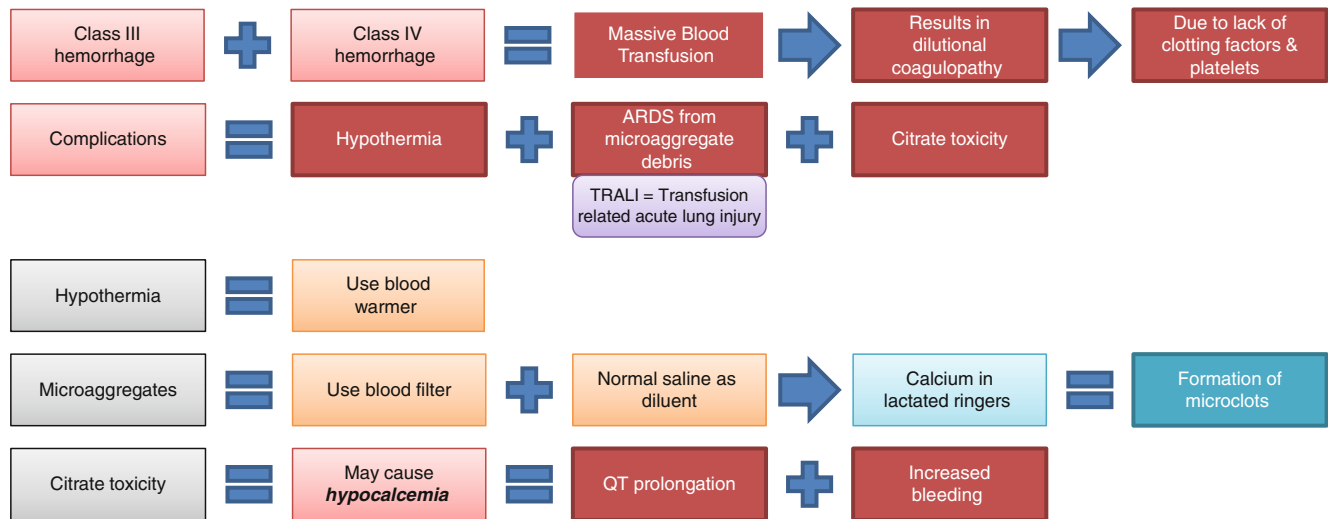
Transfusion Therapy

Packed Red Blood Cells (PRBC)



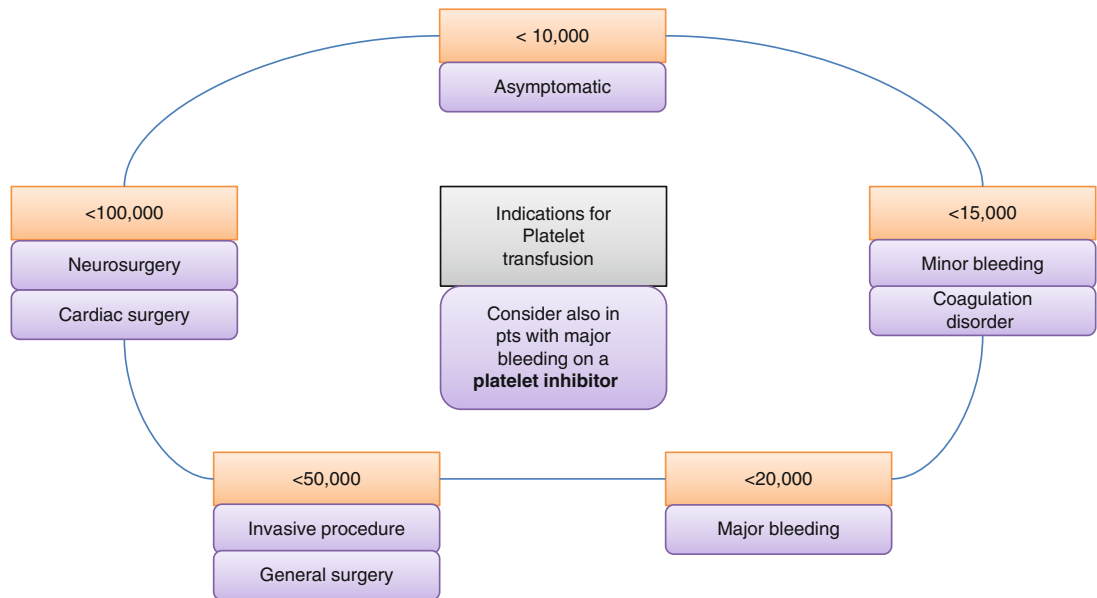
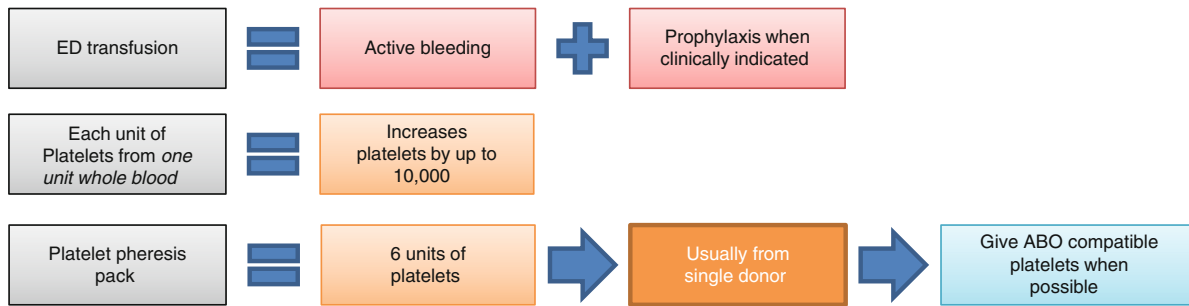
Massive Blood Transfusion

Bottom figure image (Reprinted from Allen B, Ganti L, Desai B. Trauma and ATLS. In: Allen B, Ganti L, Desai B, editors. Quick hits in emergency medicine. New York: Springer; 2013. p. 37–44. With permission from Springer Science + Business Media)

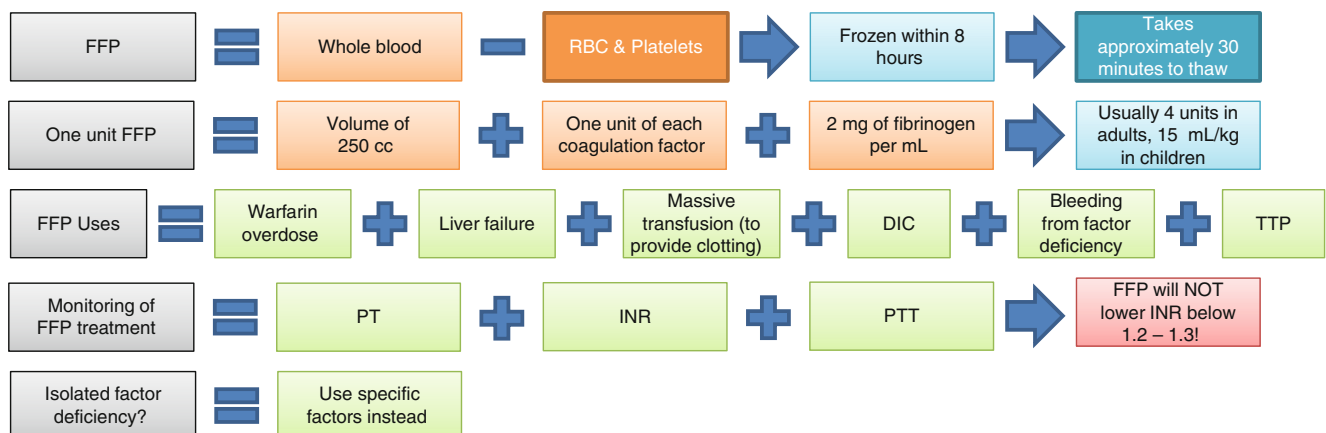


	Class I	Class II	Class III	Class IV
Blood Loss	< 750	750-1500	1500-2000	> 2000
% Blood Vol.	< 15%	15 – 30%	30 – 40%	> 40%
Pulse	< 100	> 100	> 120	> 140
Blood Pressure	Normal	Normal	Decreased	Decreased
Pulse Pressure	Normal	Decreased	Decreased	Decreased
Resp. Rate	14 – 20	20 – 30	30 – 40	> 40
UOP	> 30	20 – 30	5 – 15	negligible
Mental Status	sl. Anxious	mildly anx	confused	lethargic
Fluid	crystalloid	crystalloid	blood	blood

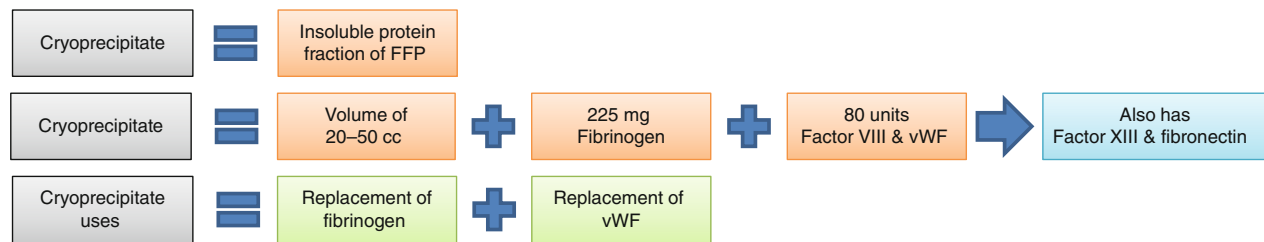
Platelet Transfusion



Fresh Frozen Plasma

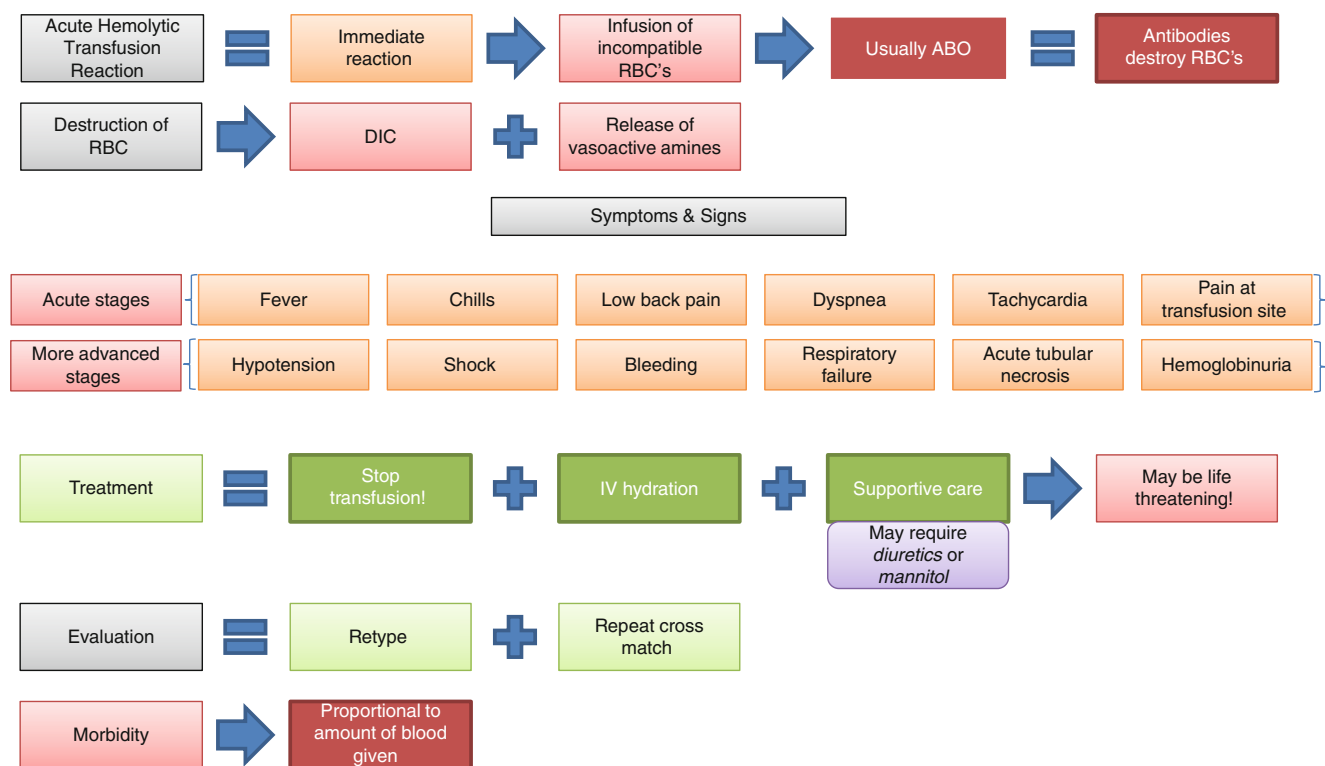


Cryoprecipitate

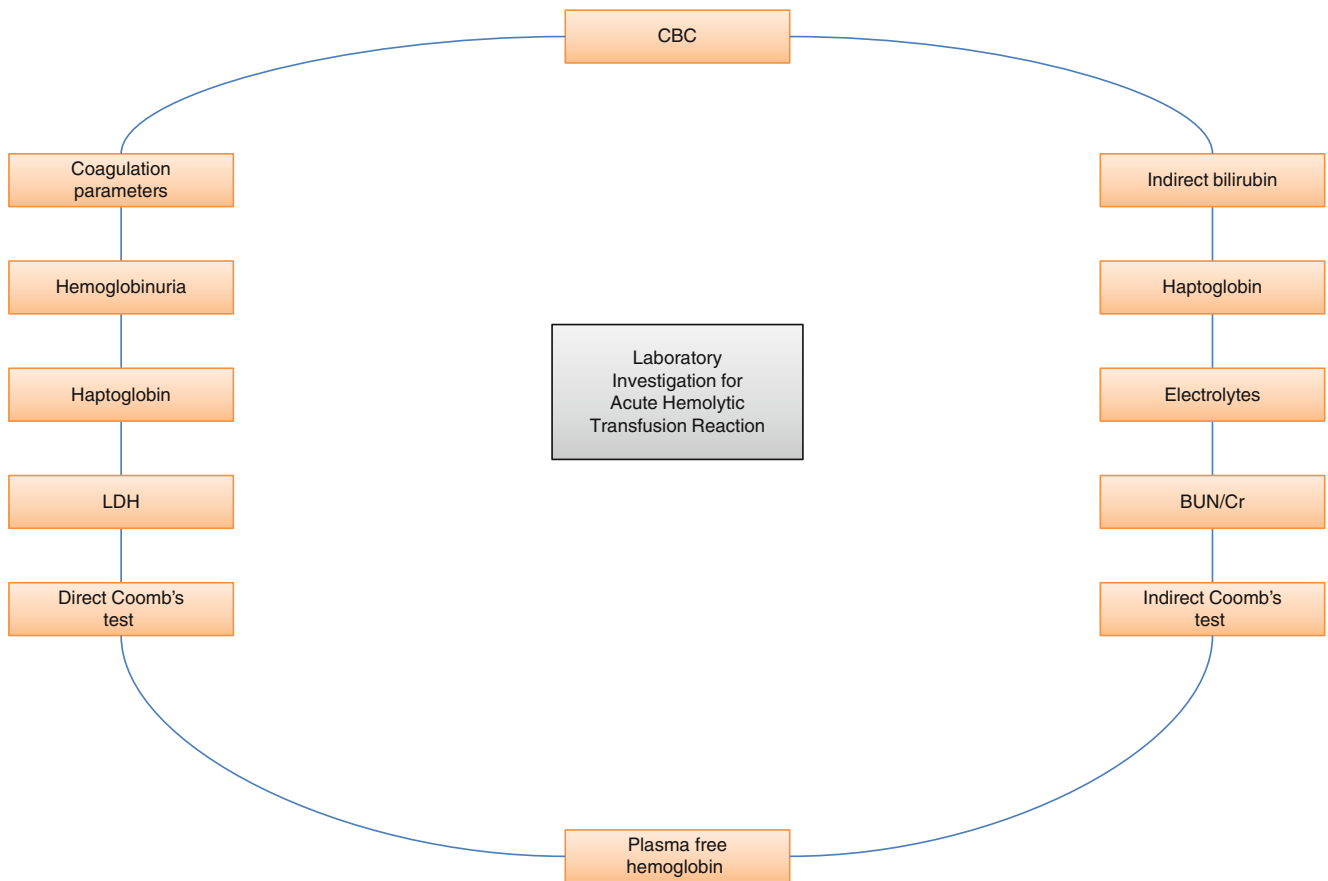


Complications of Transfusion Therapy

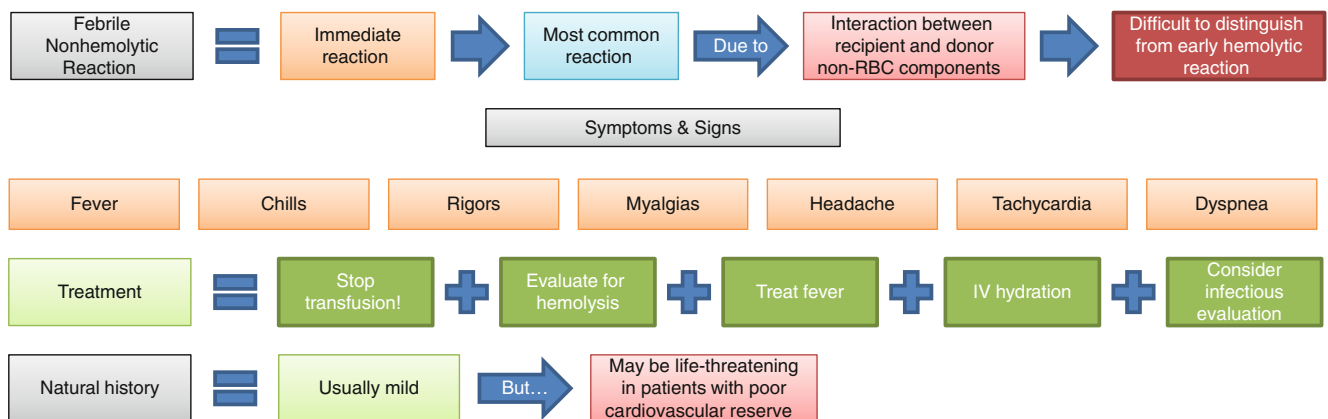
Acute Hemolytic Transfusion Reaction



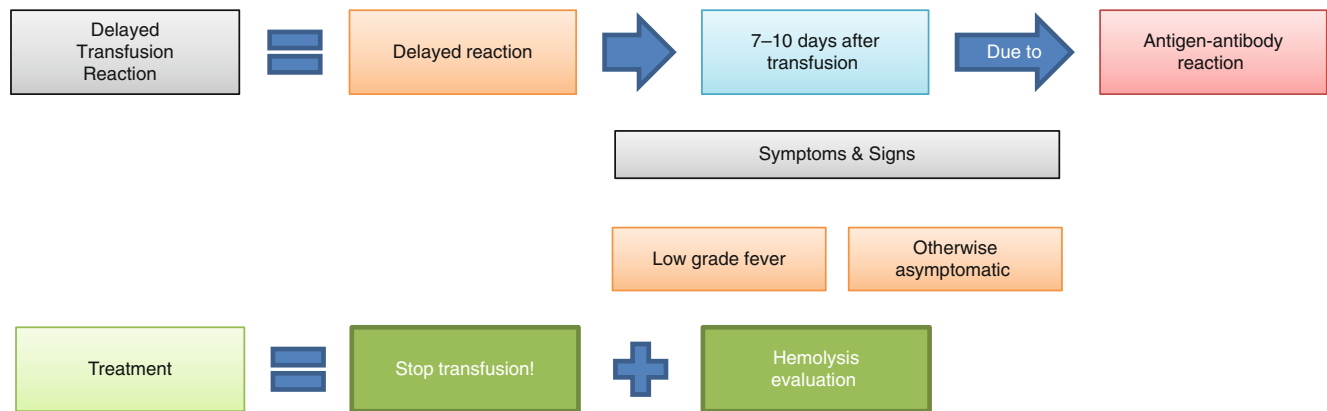
Laboratory Investigation for Acute Hemolytic Transfusion Reaction



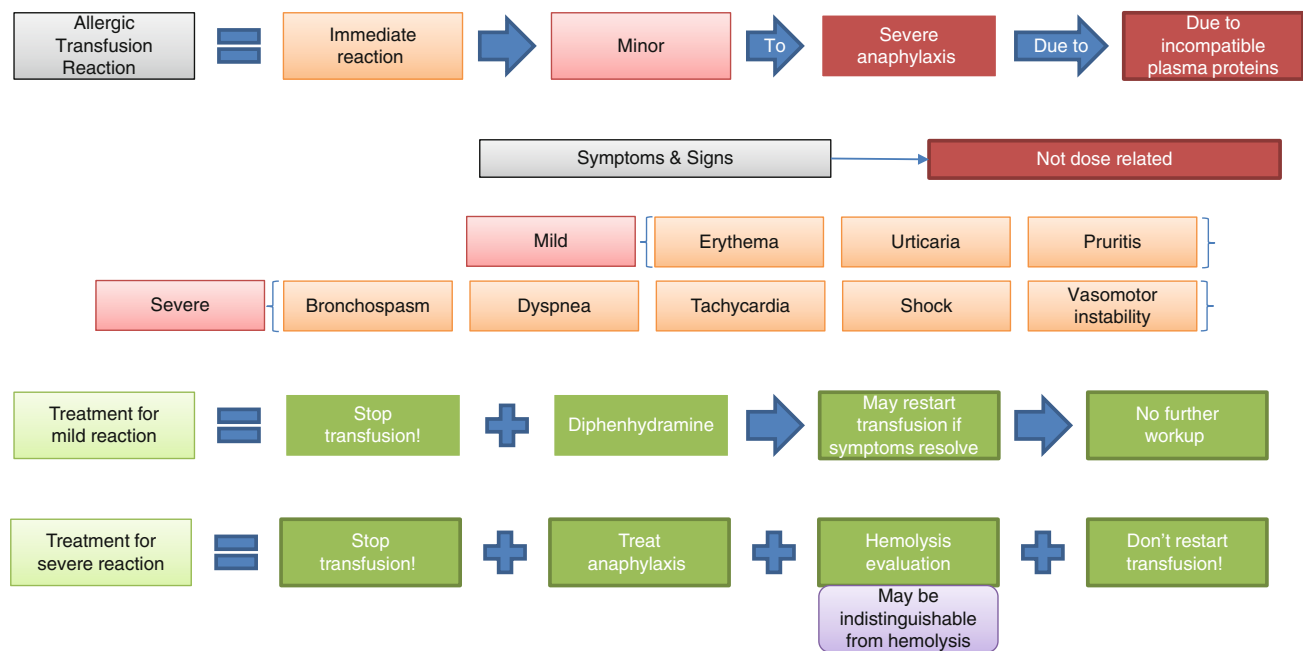
Febrile Nonhemolytic Reaction



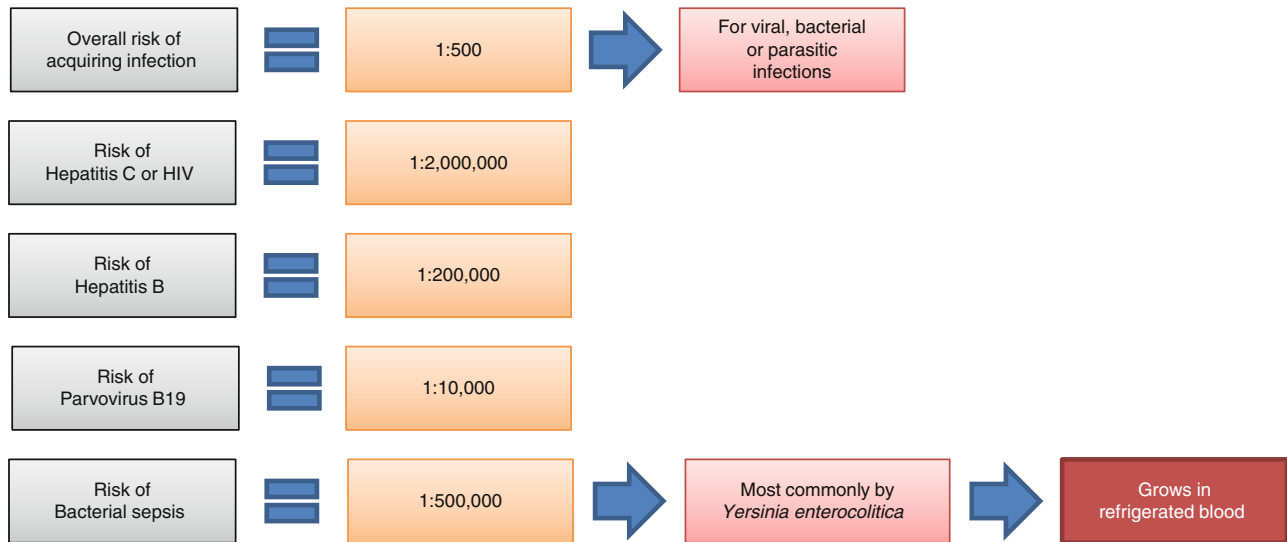
Delayed Transfusion Reaction



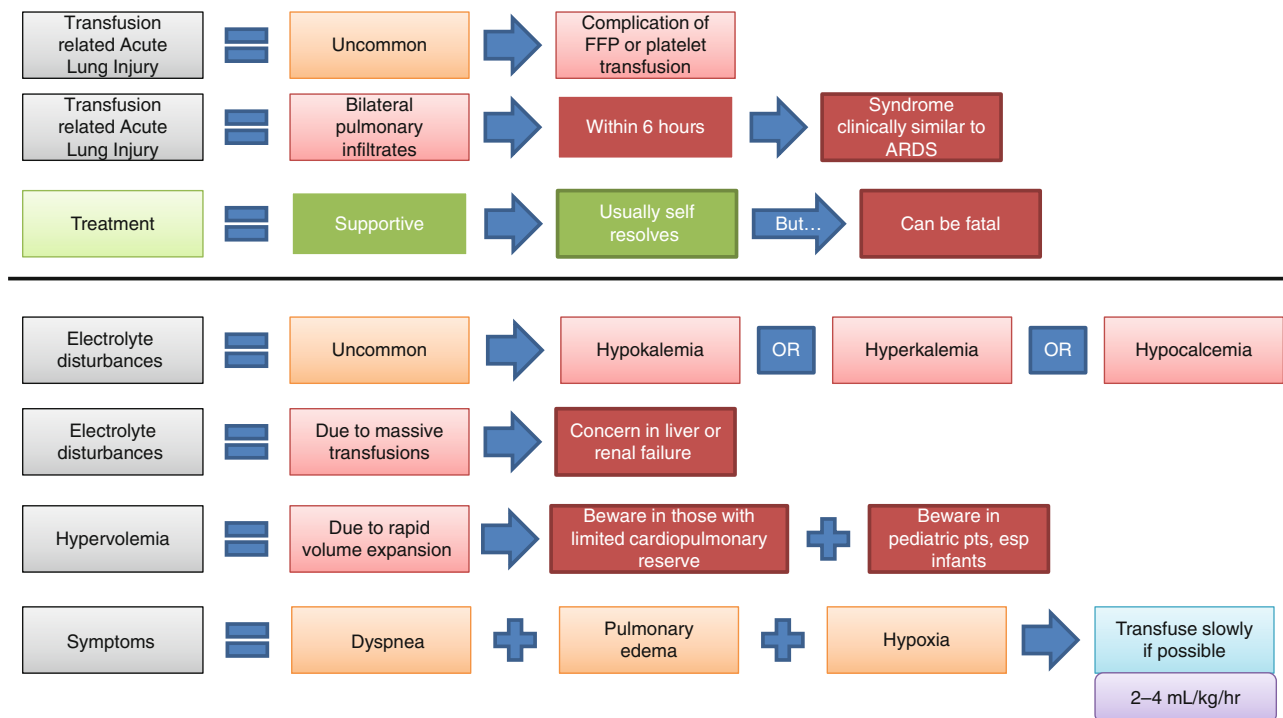
Allergic Transfusion Reaction



Infectious Complications of Transfusion

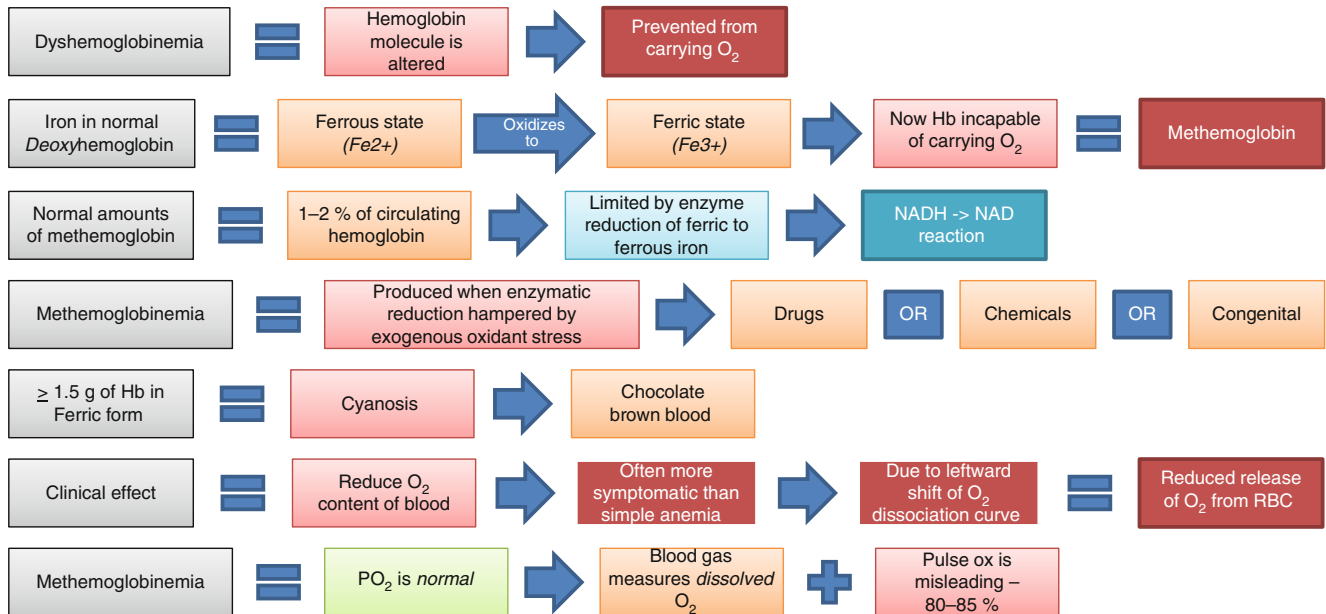


Other Complications of Transfusion

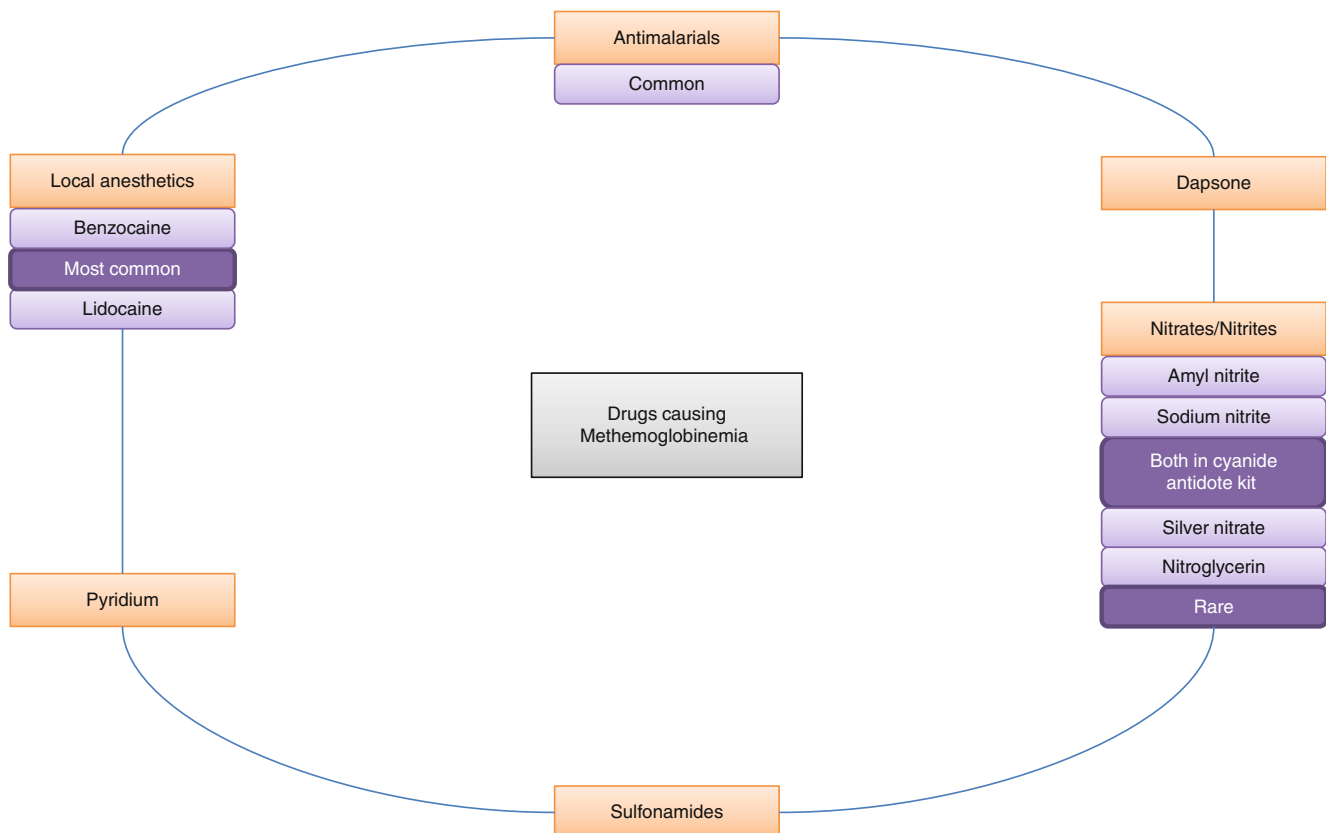


Dyshemoglobinemias

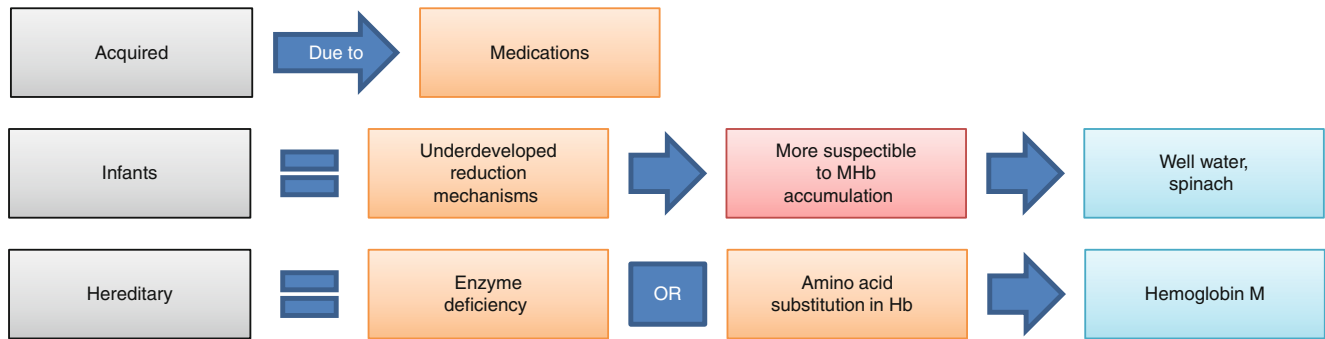
Introduction: Methemoglobin (MHb)



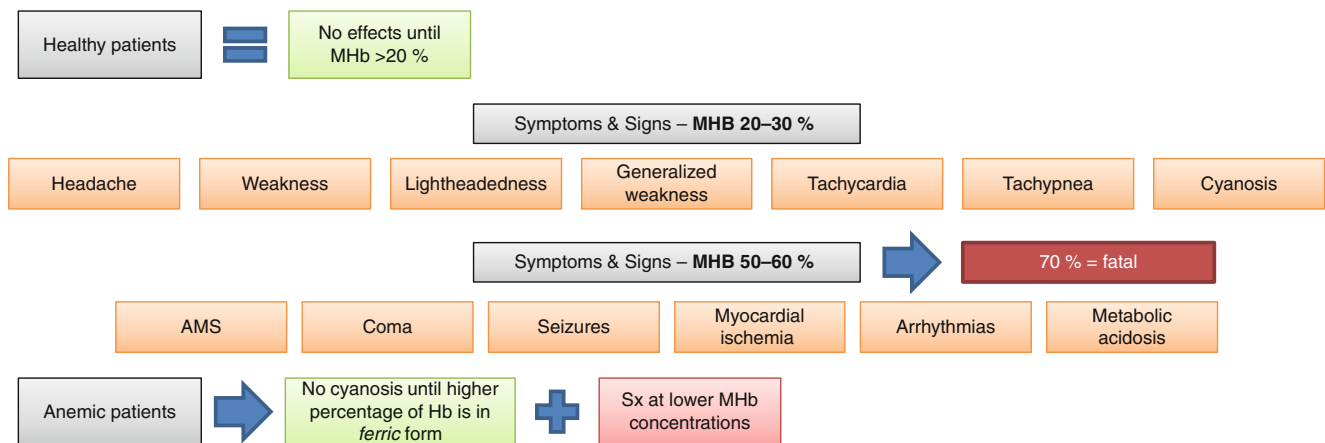
Drugs Causing Methemoglobinemia



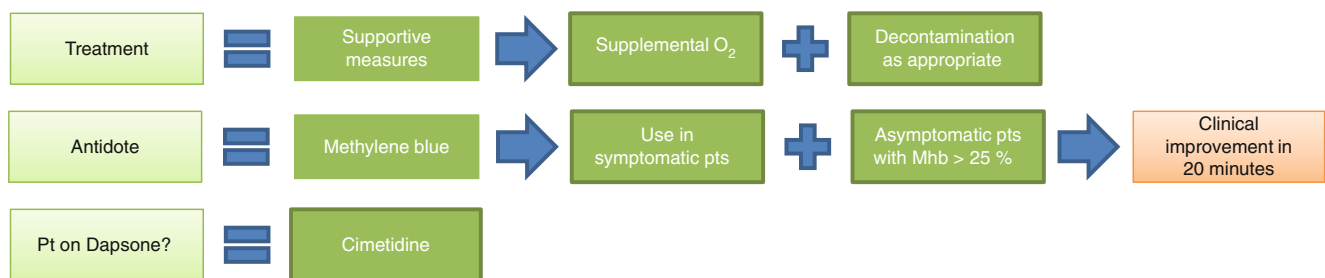
Types of Methemoglobinemia



Clinical Features

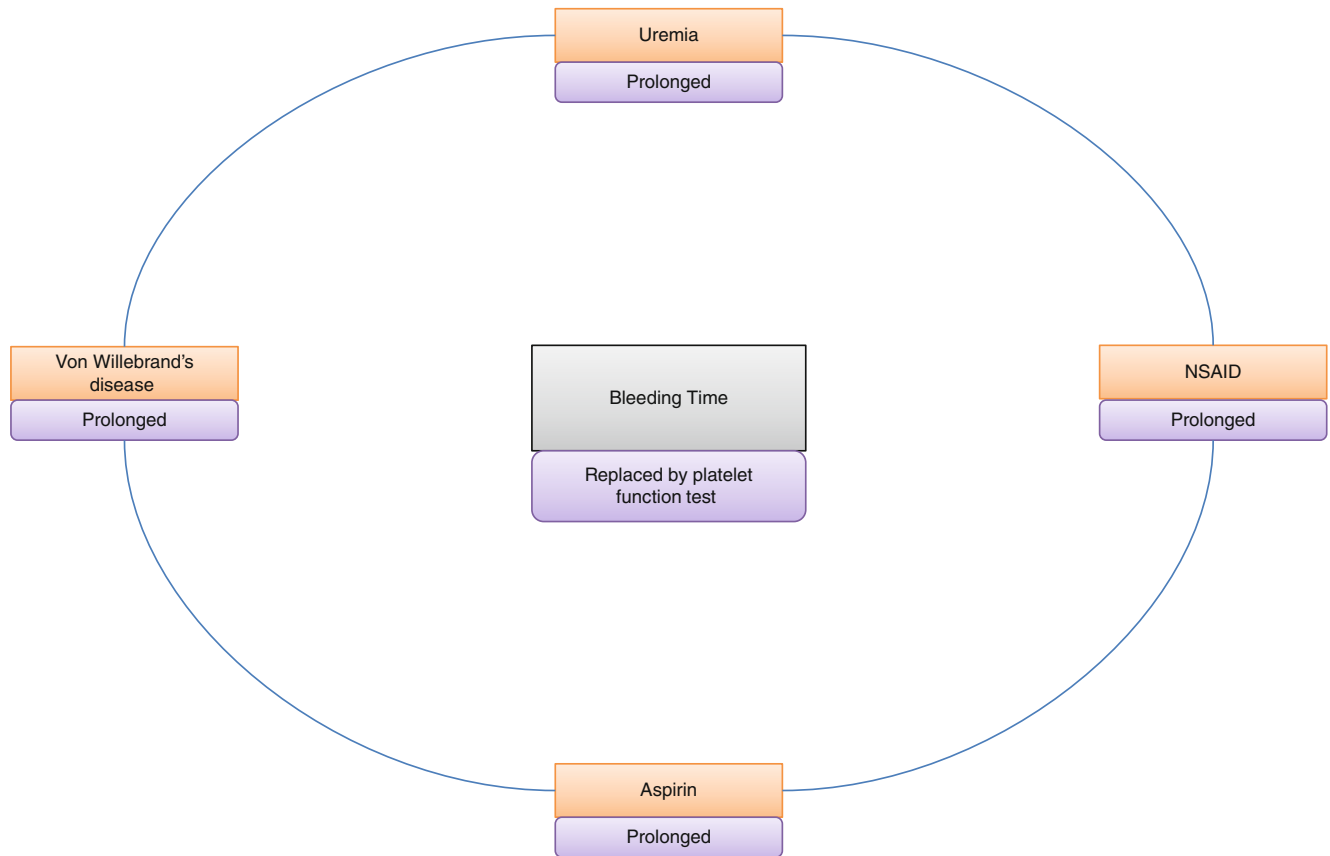


Treatment

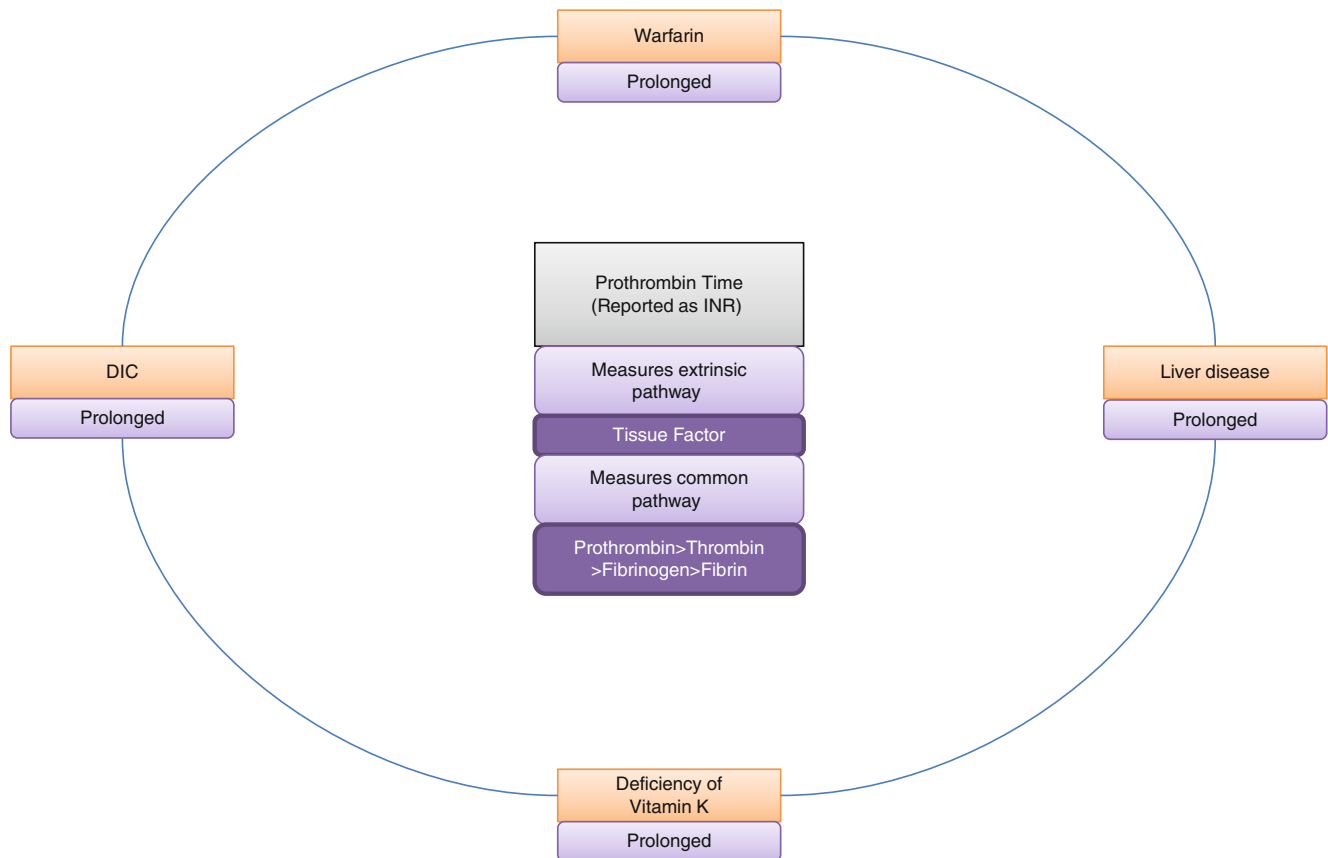


Hemostasis Tests

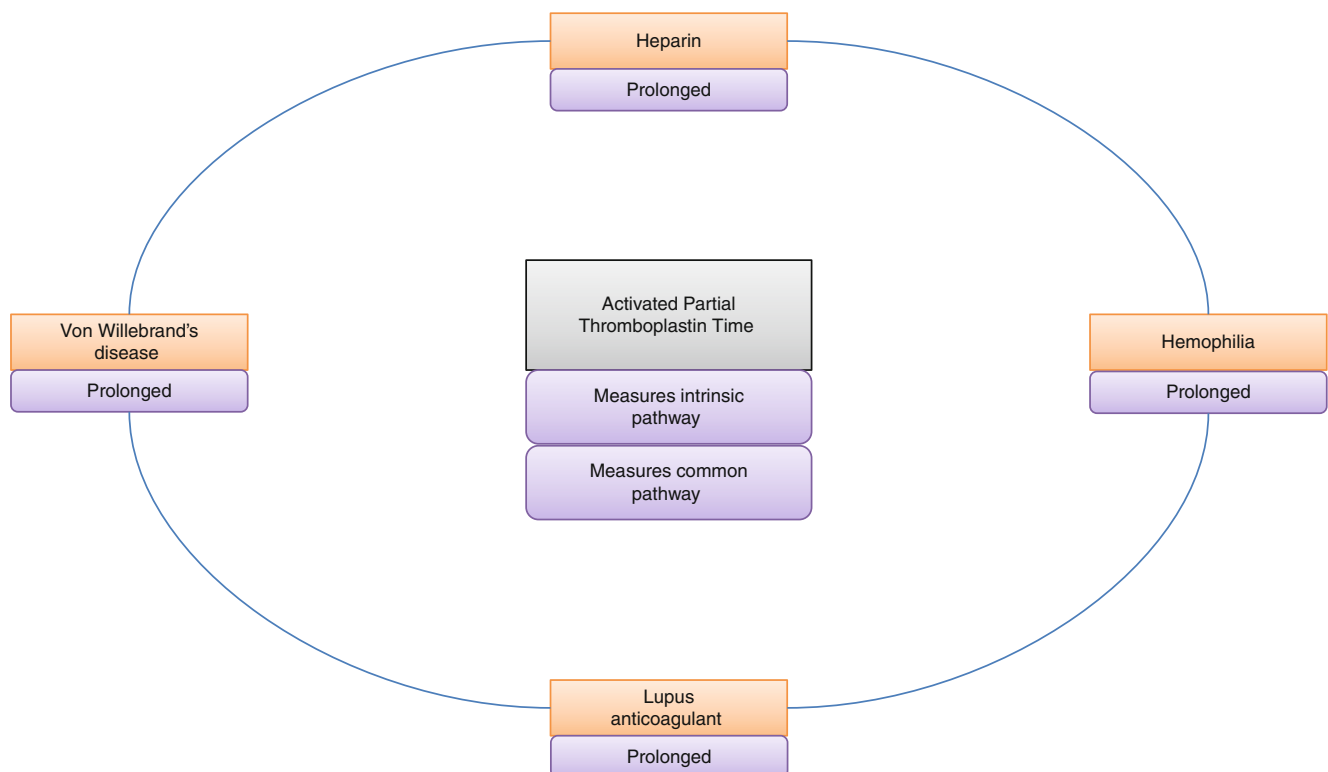
Bleeding Time



Prothrombin Time

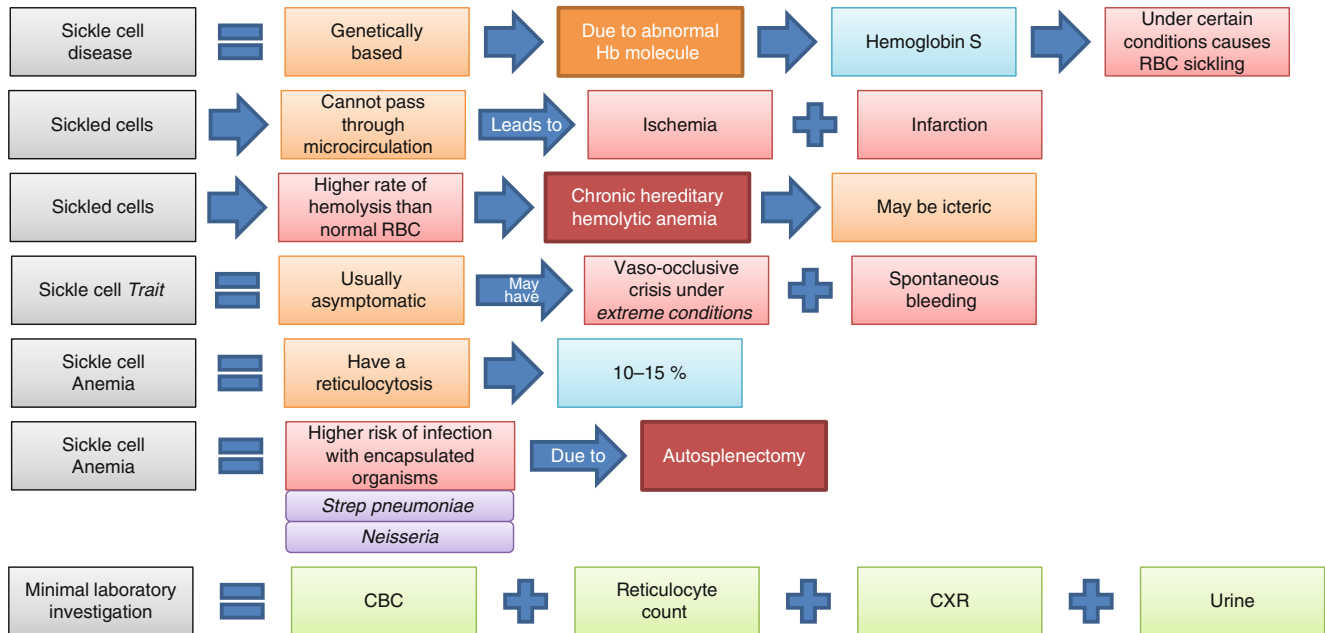


Activated Partial Thromboplastin Time

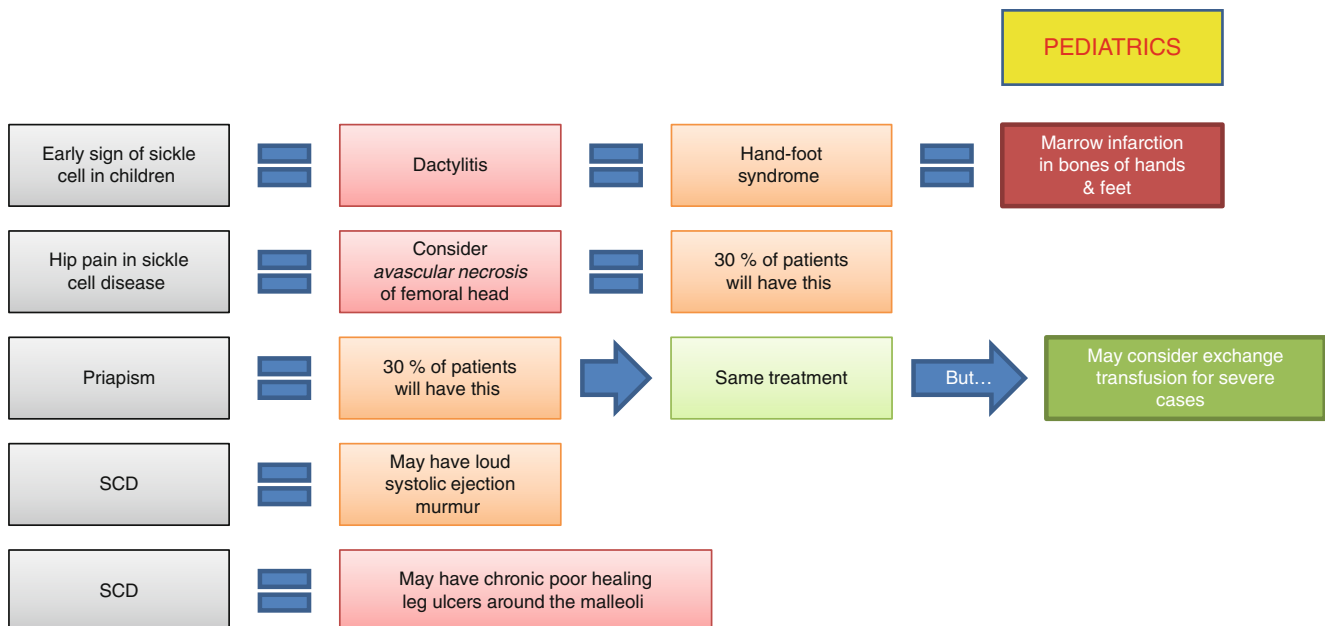


Sickle Cell Anemia

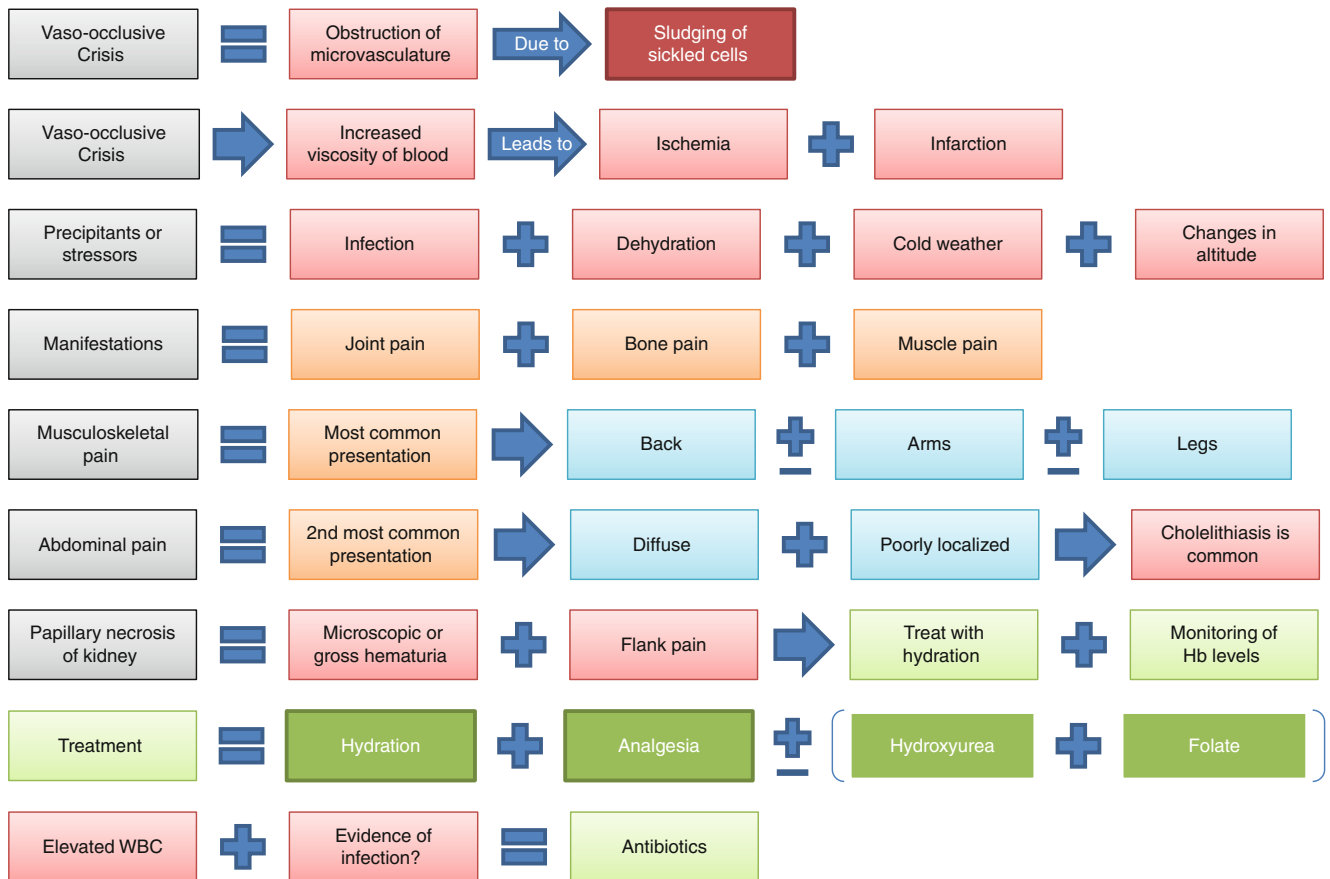
Introduction



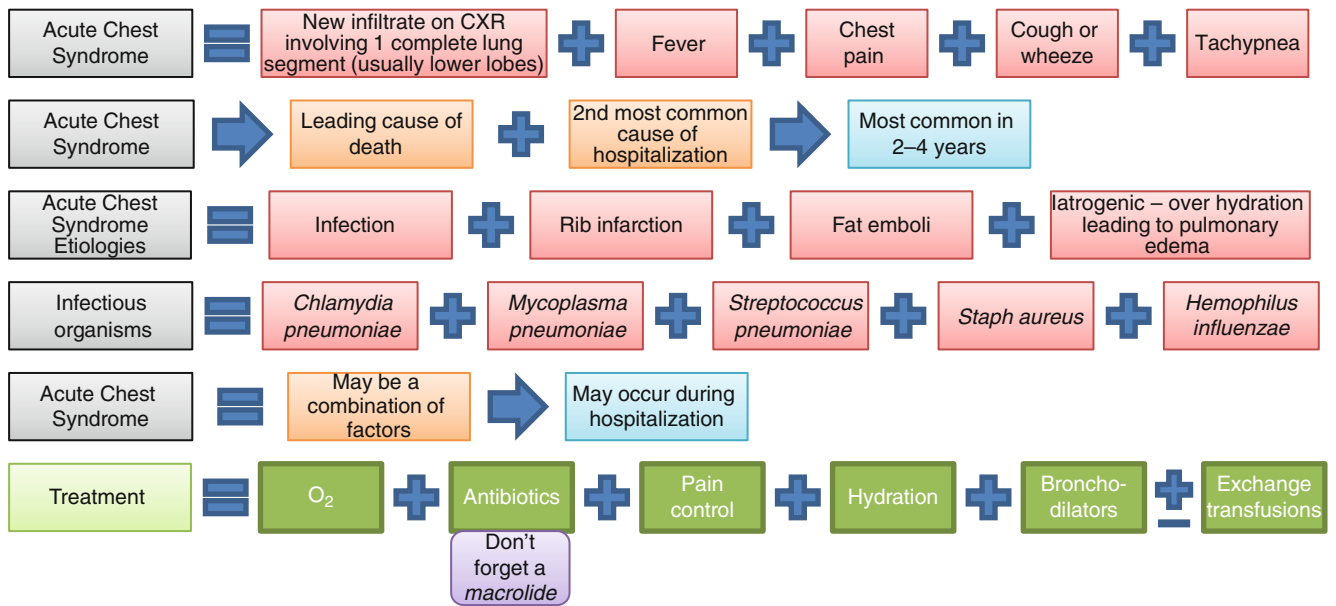
Sickle Cell Tibdits



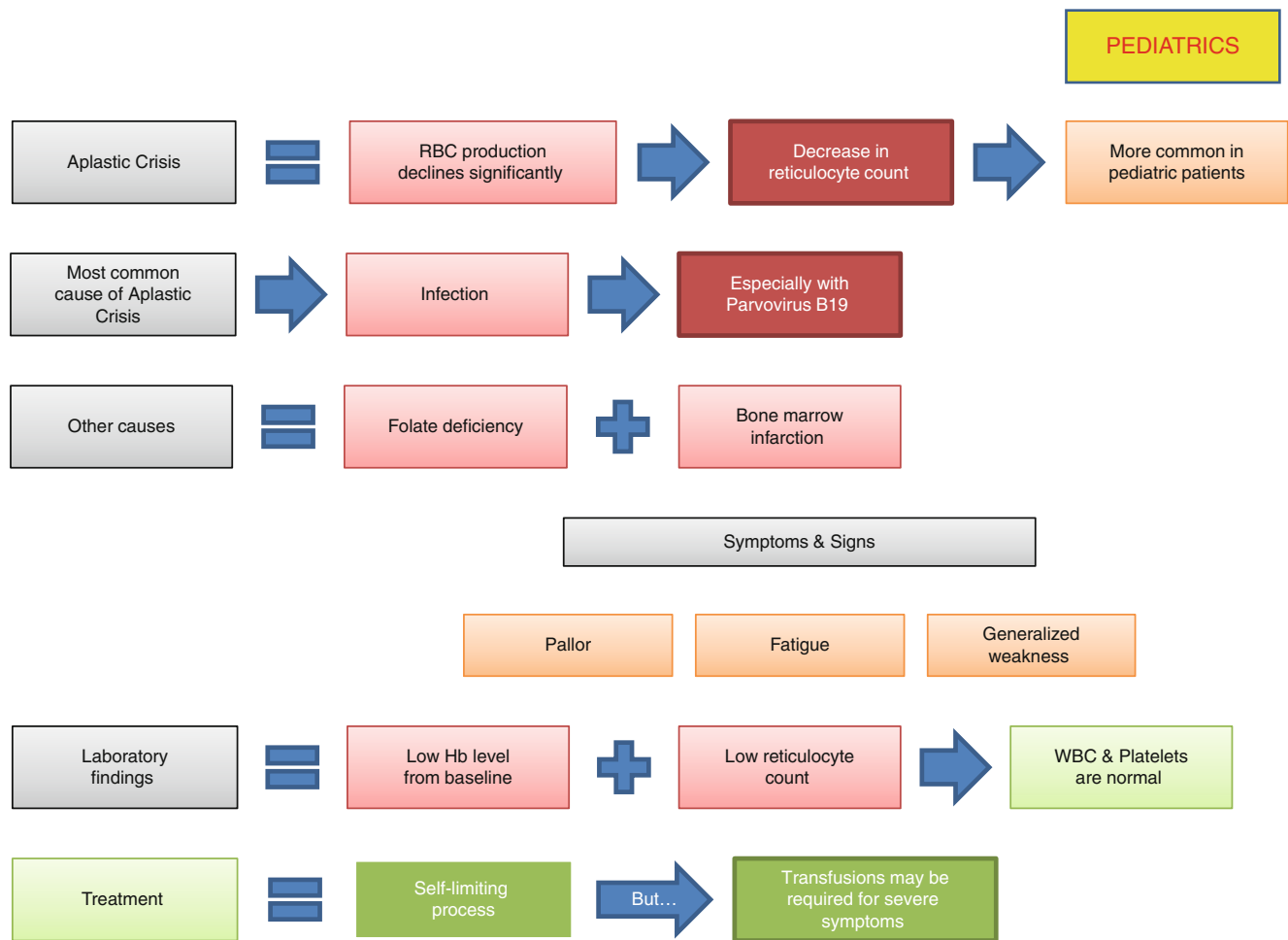
Vaso-occlusive Crisis



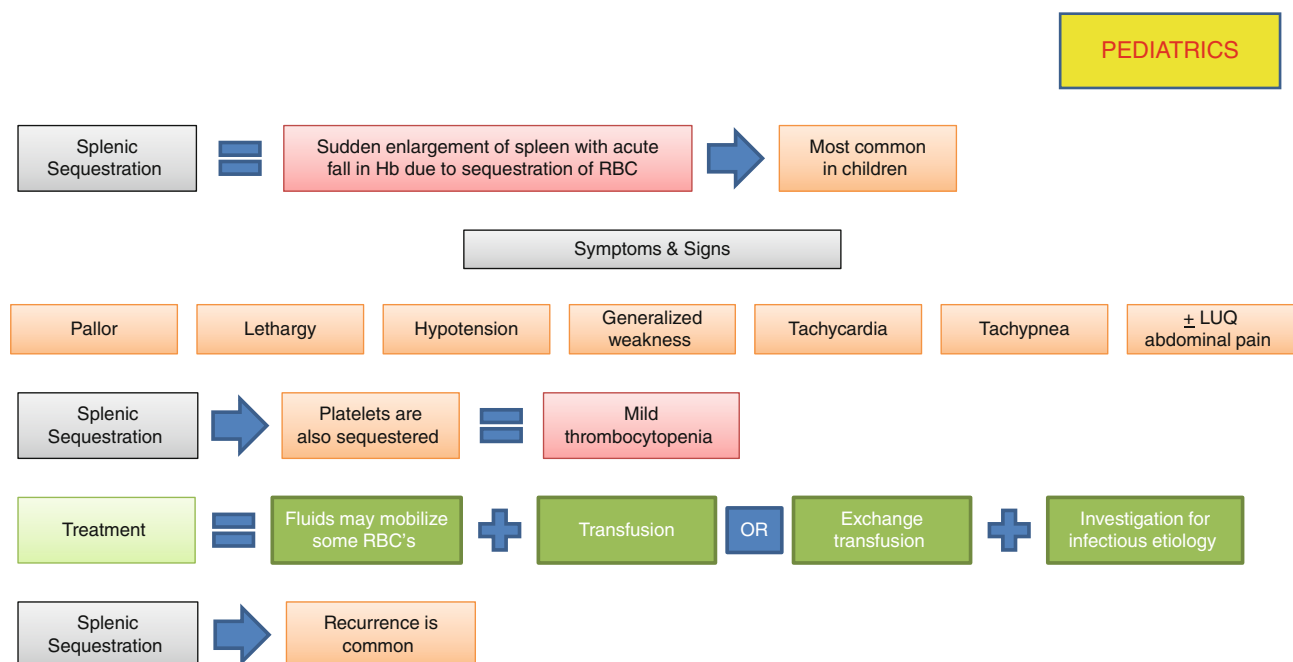
Acute Chest Syndrome



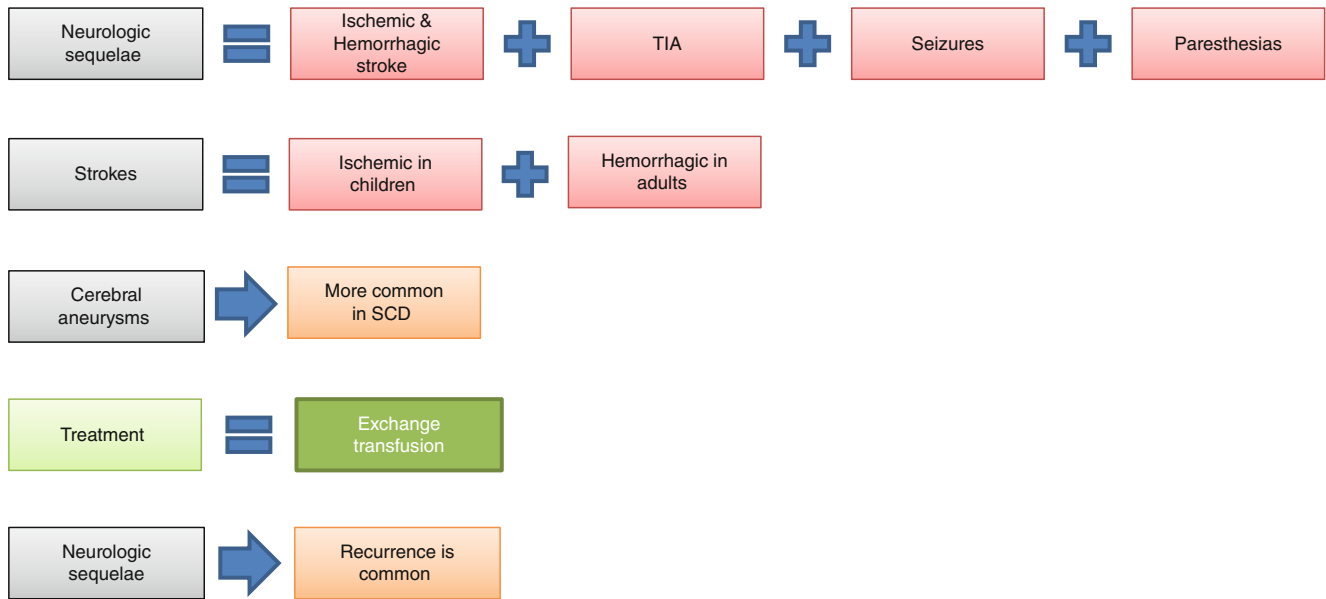
Aplastic Crisis



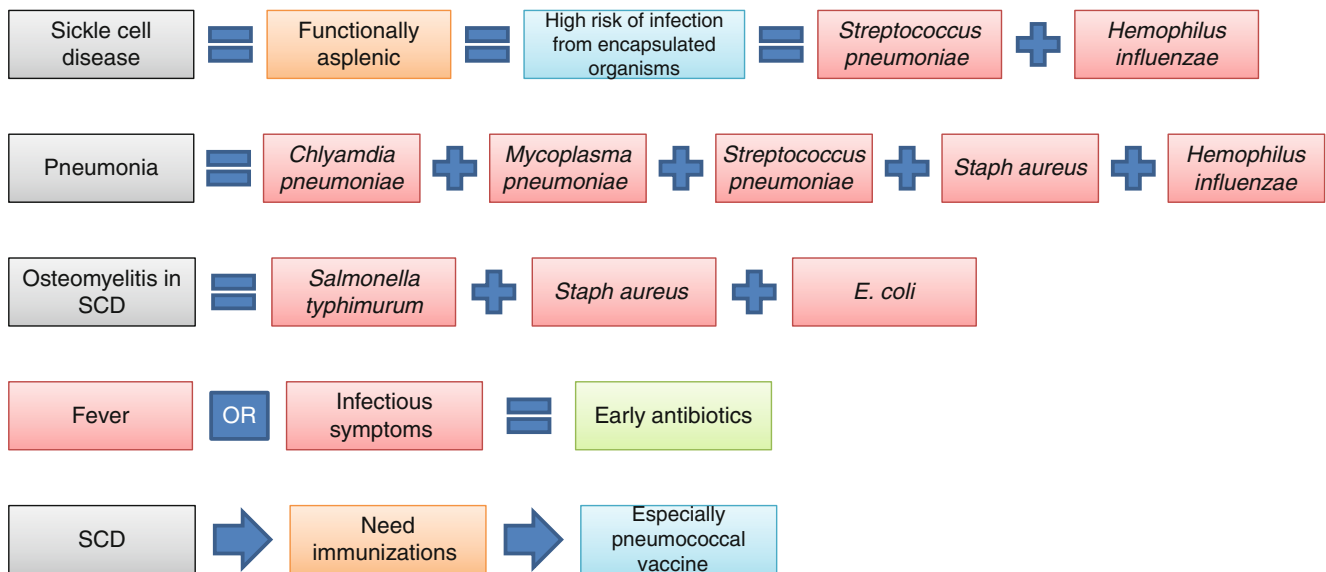
Splenic Sequestration



Neurologic Complications of SCD

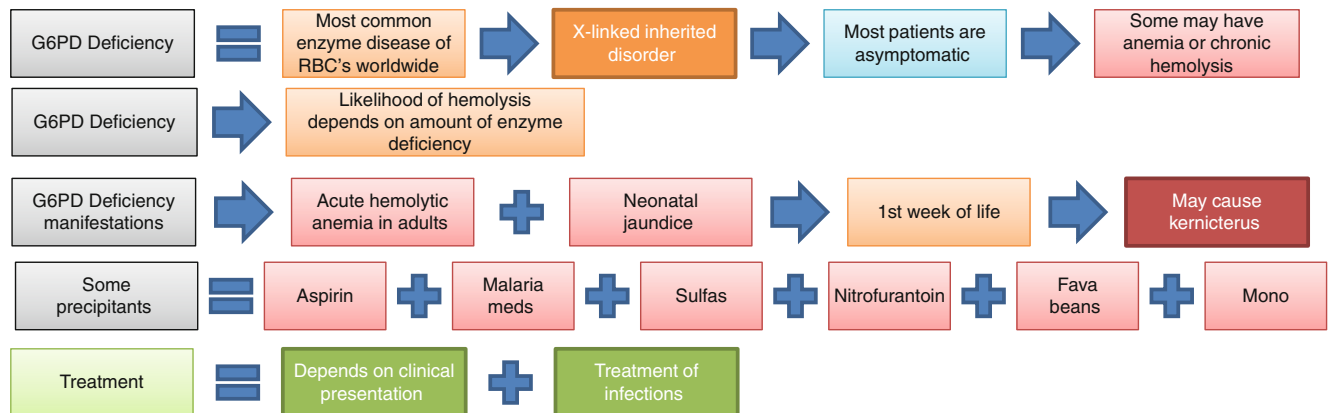


Infectious Complications of SCD

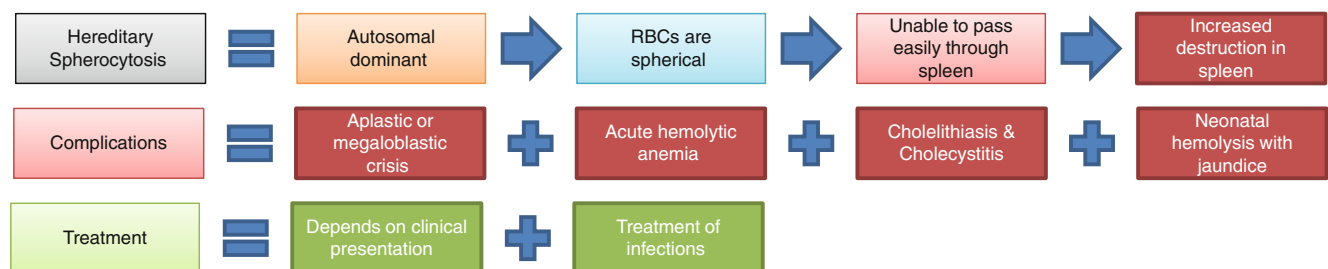


Hereditary Hemolytic Anemias

G6PD Deficiency

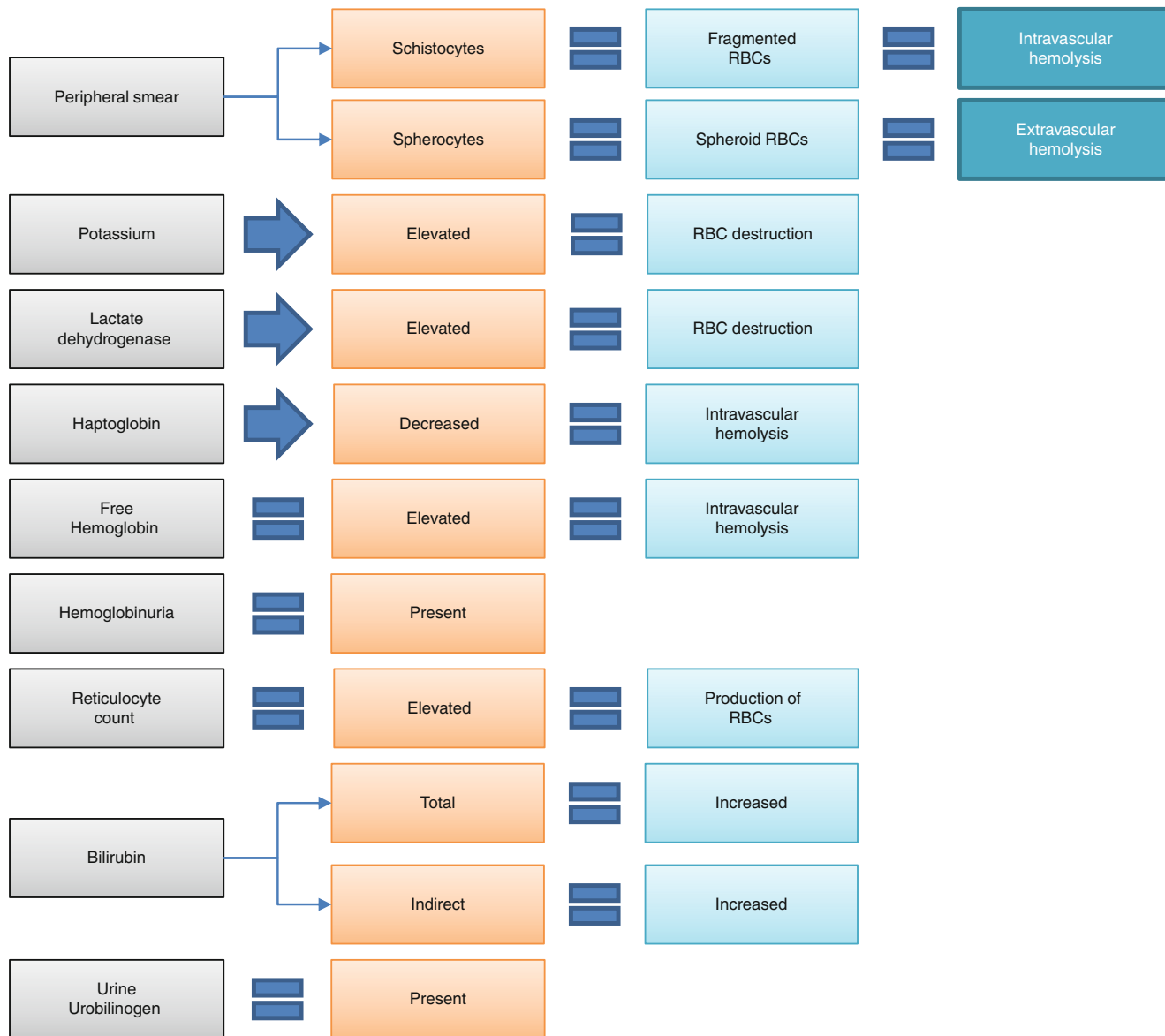


Hereditary Spherocytosis

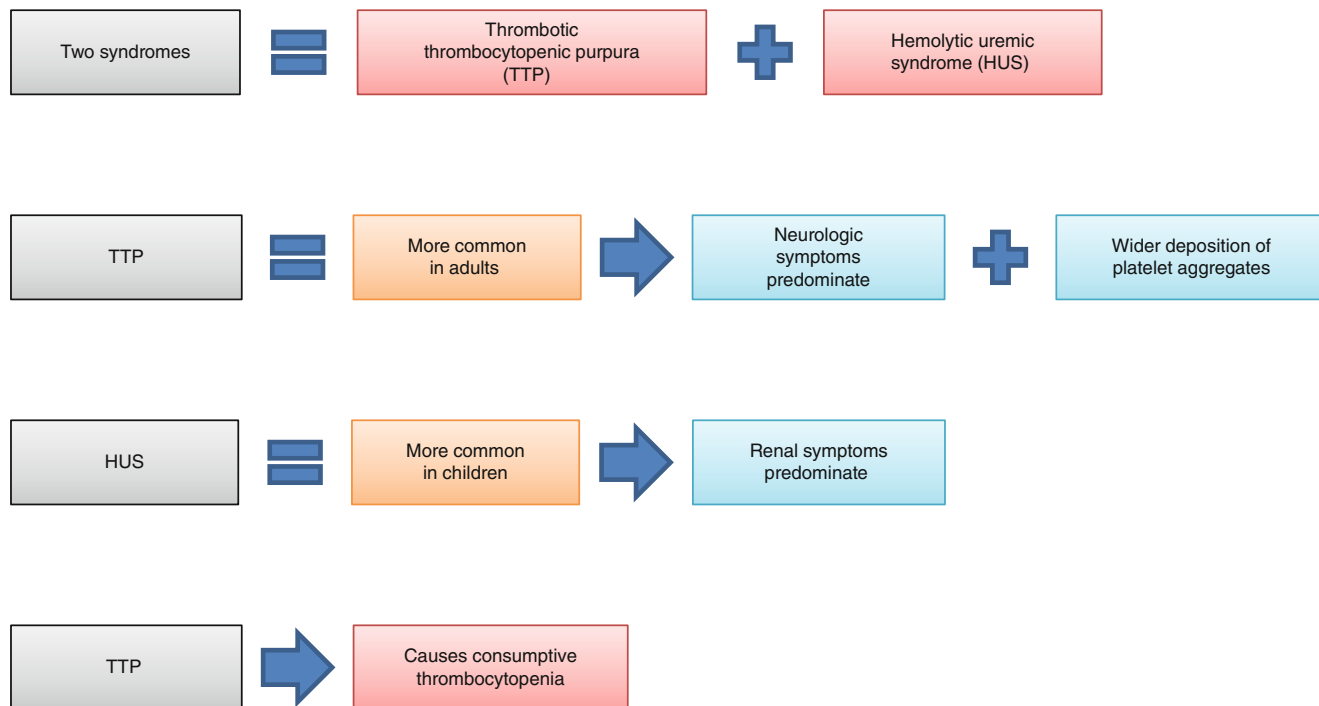


Specific Labs for Hemolytic Anemia

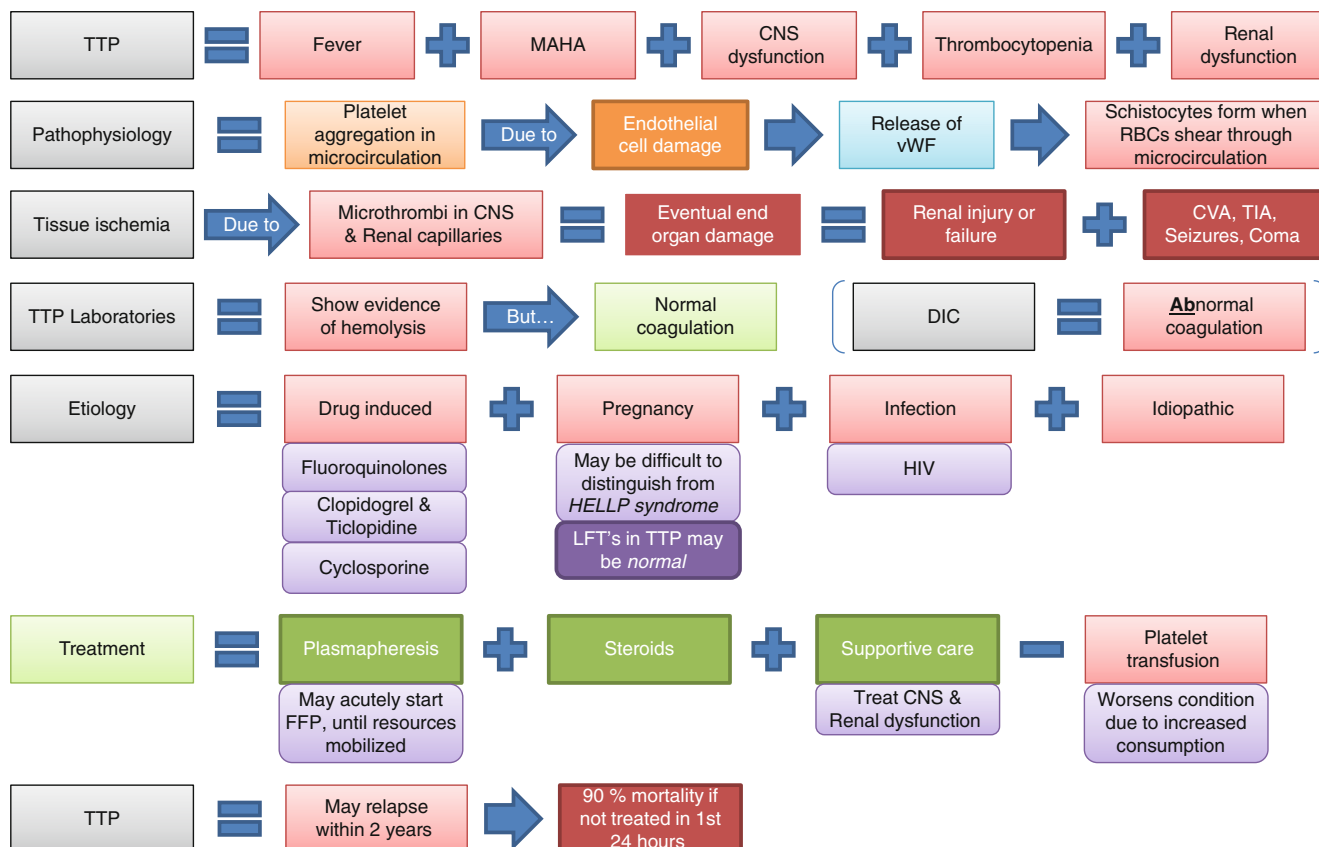
Acquired Hemolytic Anemia



Microangiopathic Hemolytic Anemia (MAHA)

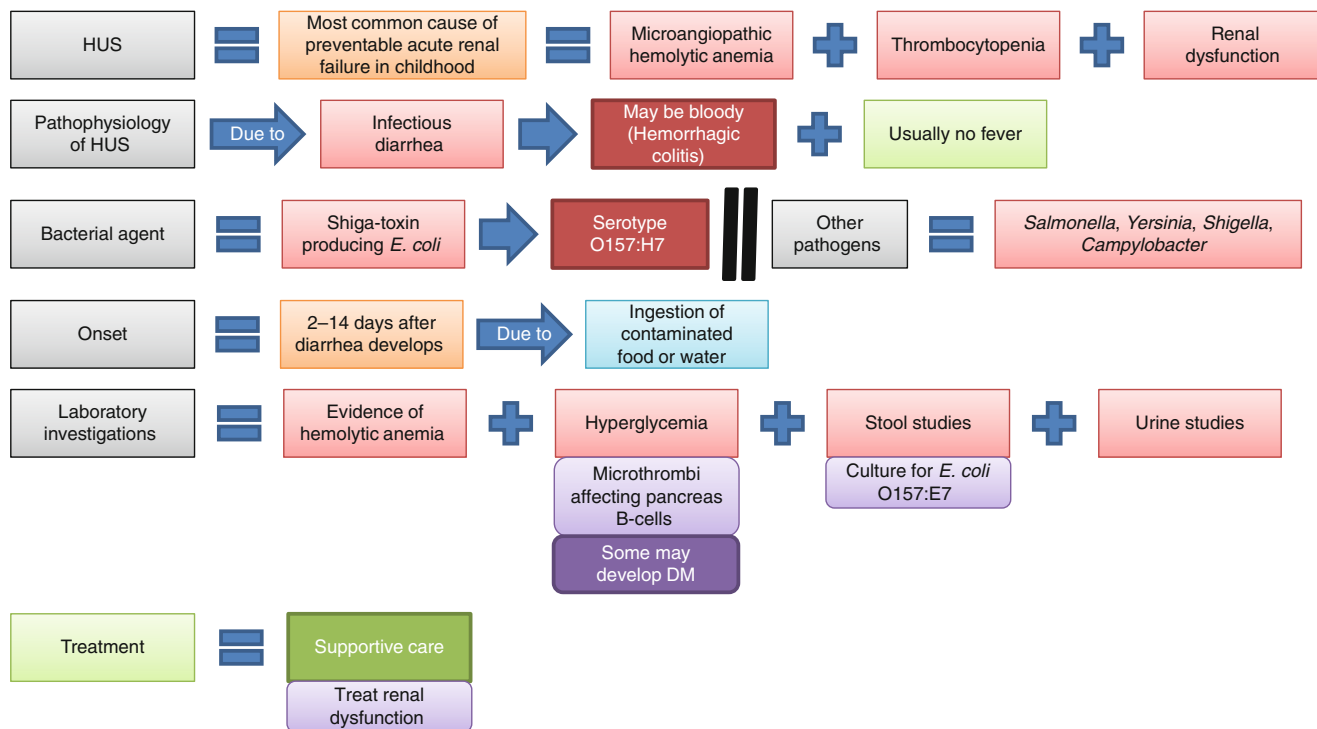


Thrombotic Thrombocytopenic Purpura (TTP)



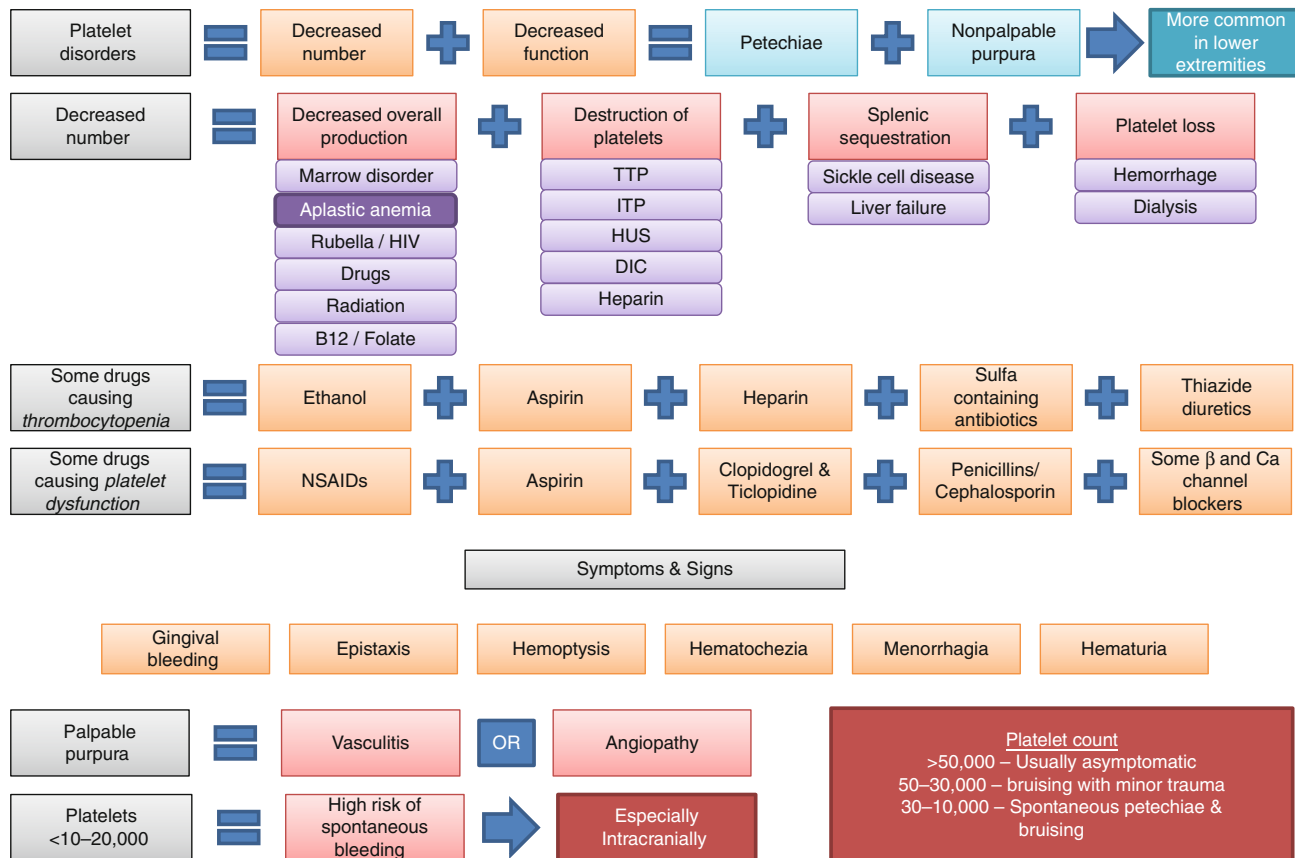
Hemolytic Uremic Syndrome (HUS)

PEDIATRICS

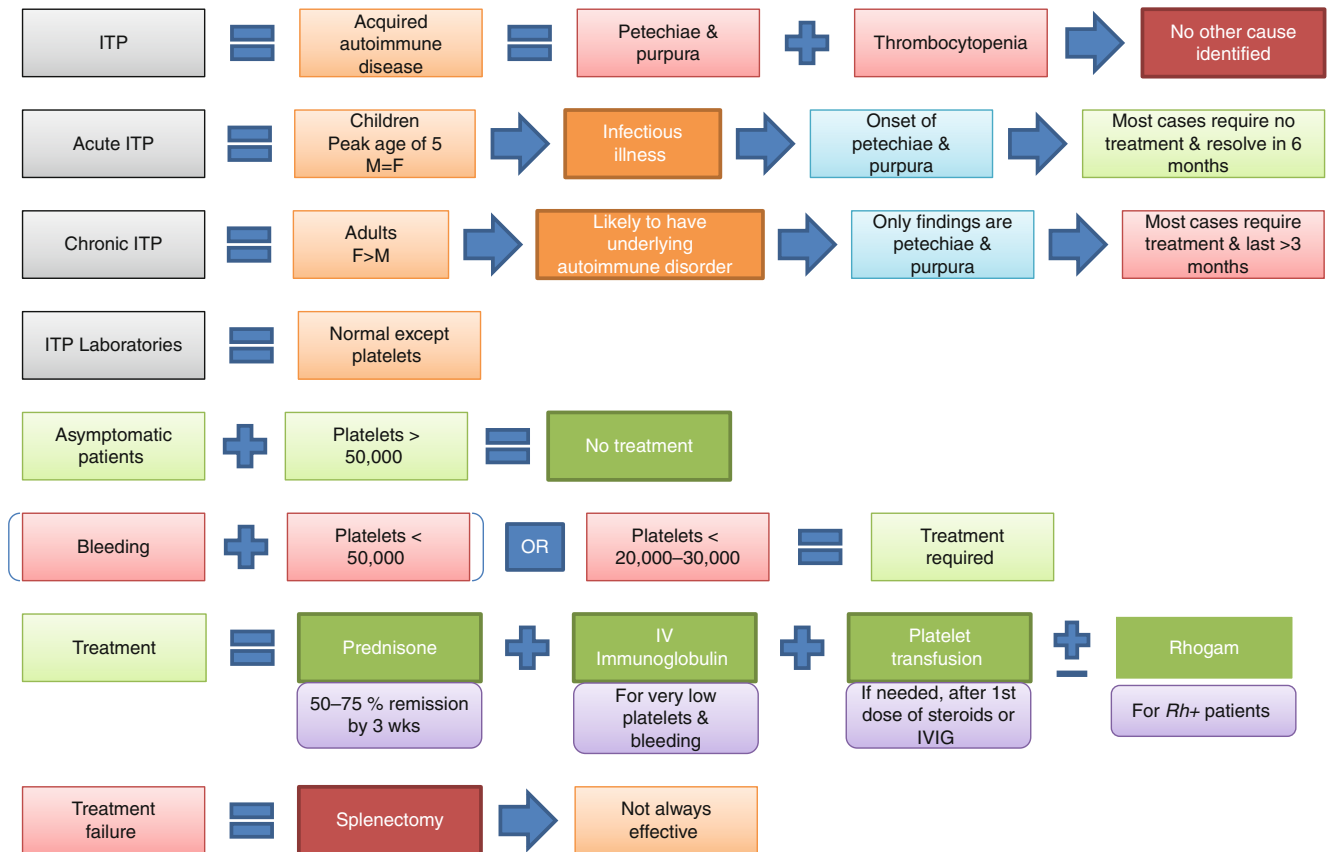


Platelet Disorders

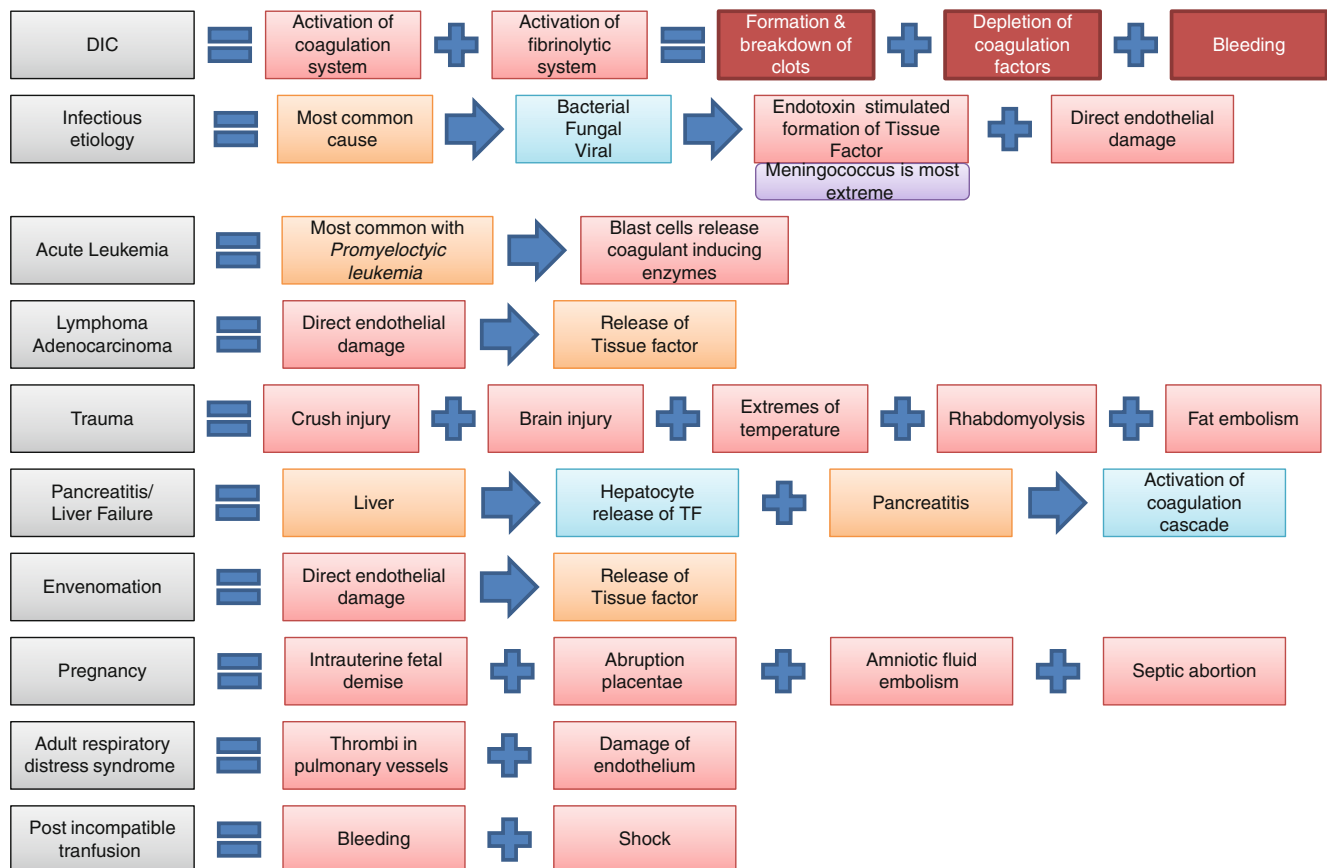
Introduction



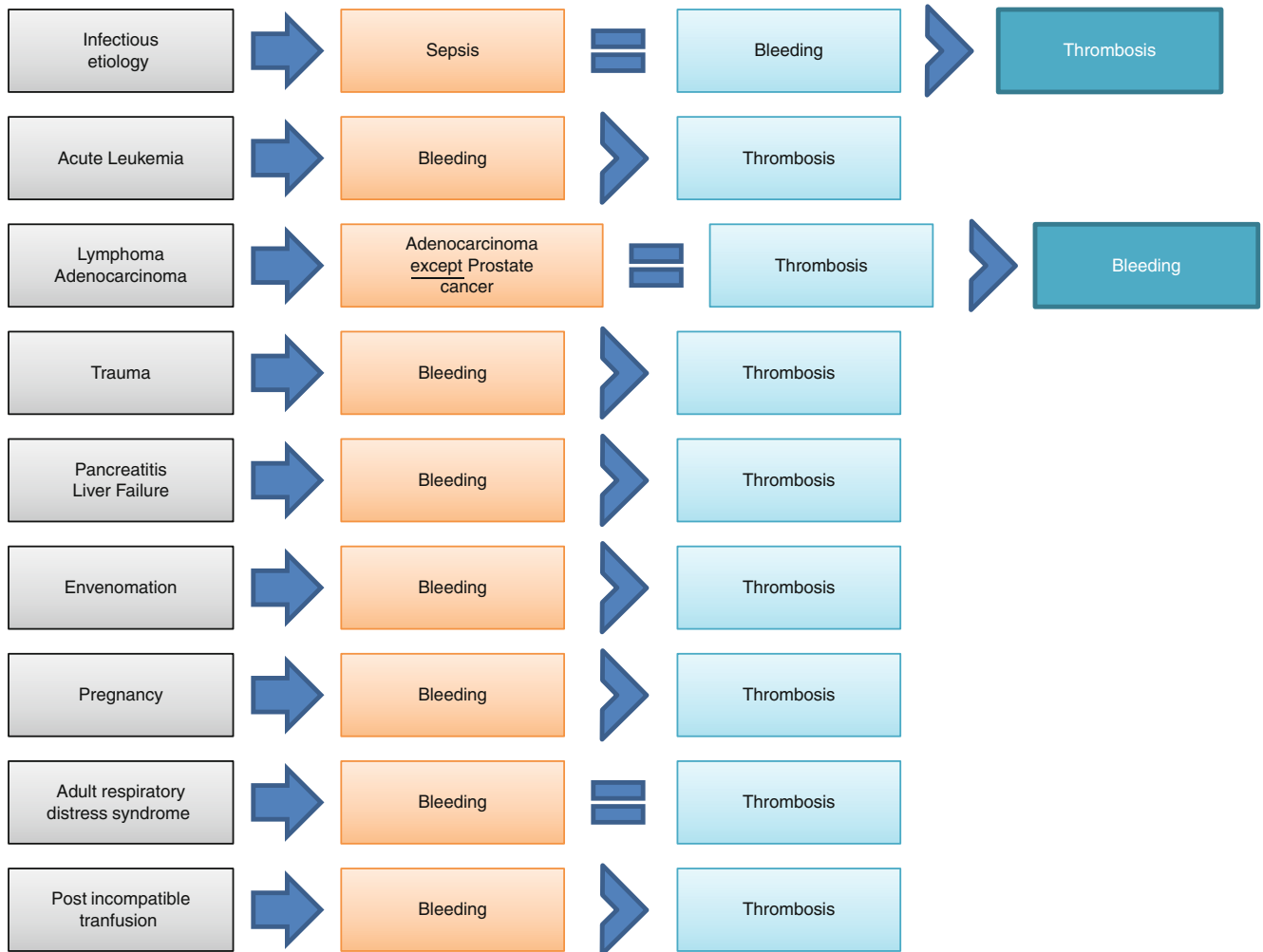
Idiopathic Thrombocytopenic Purpura (ITP)



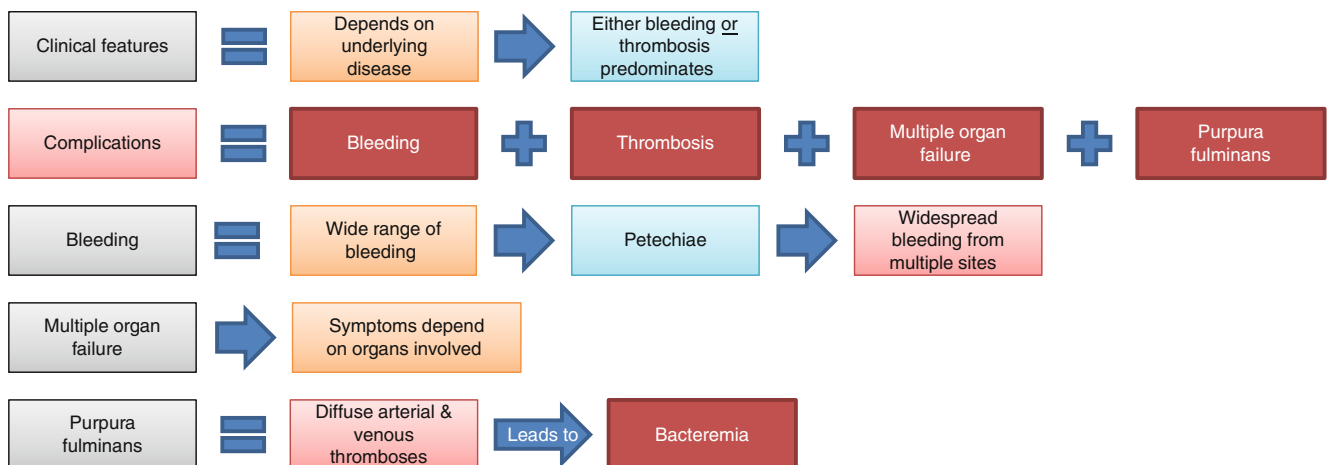
Etiologies of Disseminated Intravascular Coagulation (DIC)



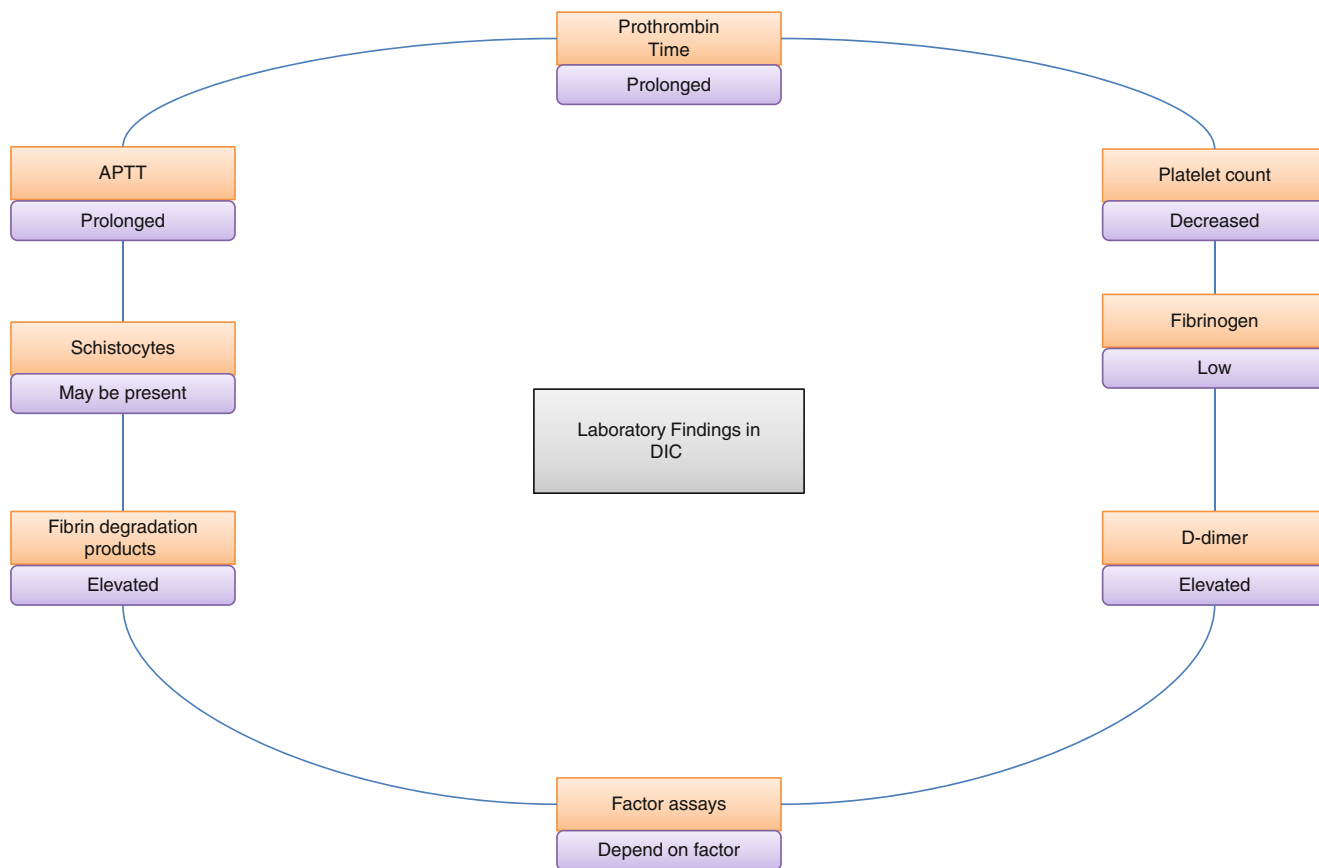
Disseminated Intravascular Coagulation (DIC)



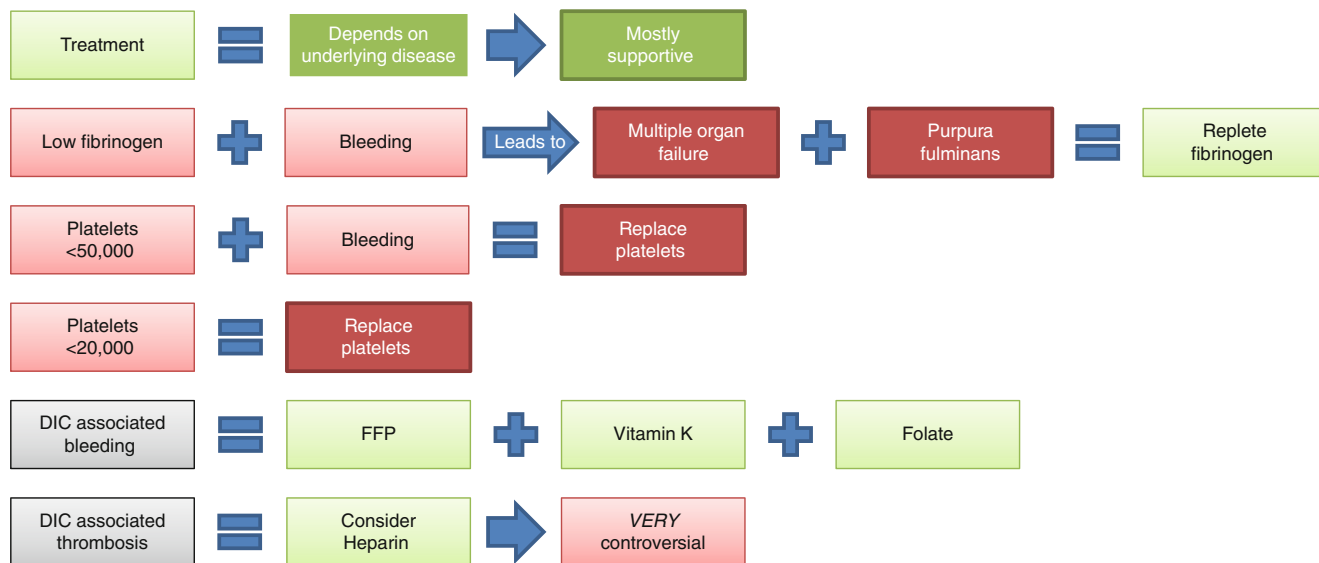
Clinical Features of DIC



Laboratory Findings in DIC



Treatment of DIC

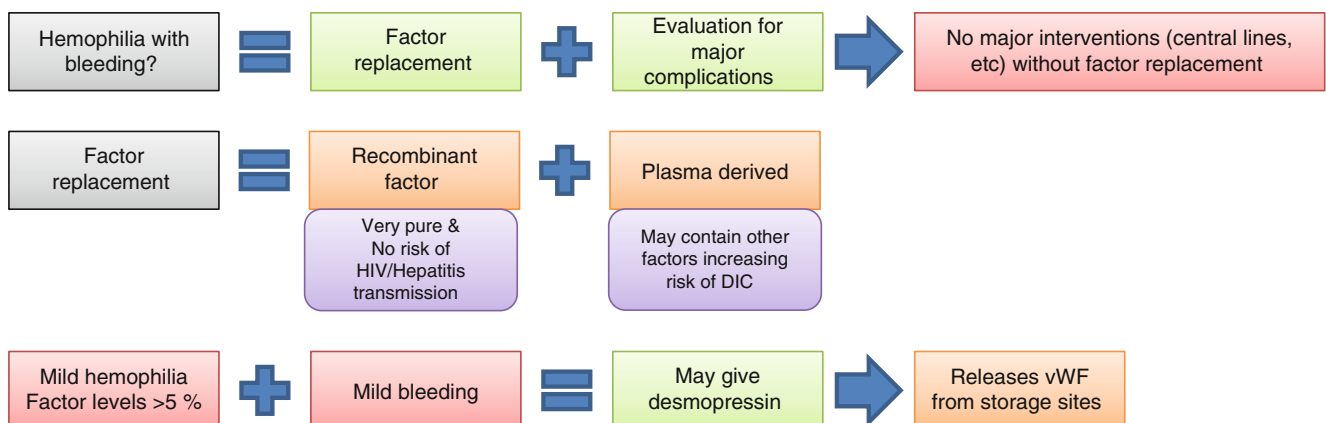


Hemophilia

Introduction

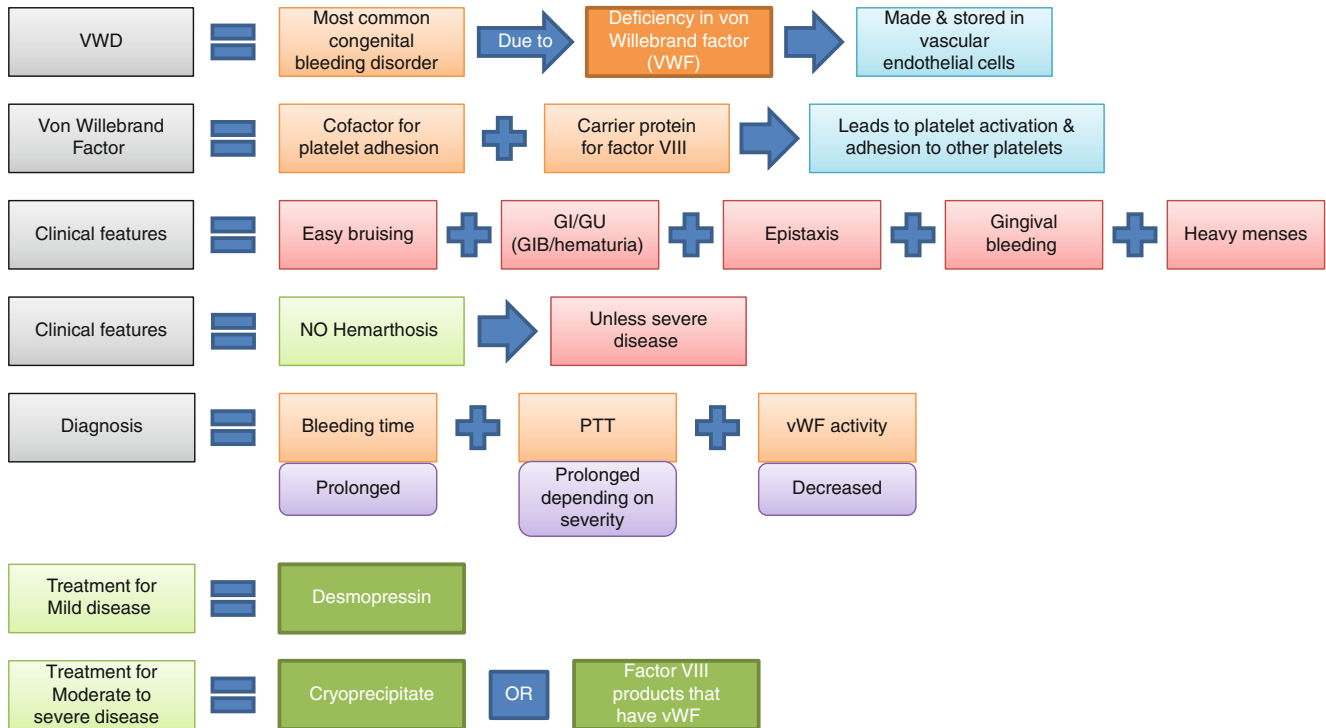


Treatment



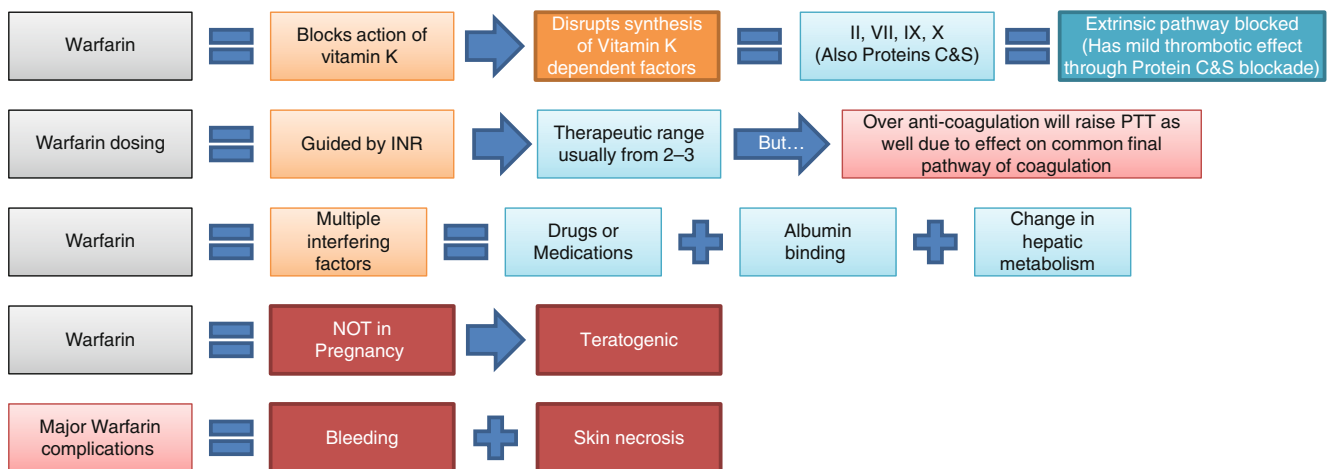
Von Willebrand's Disease

Introduction: VWD

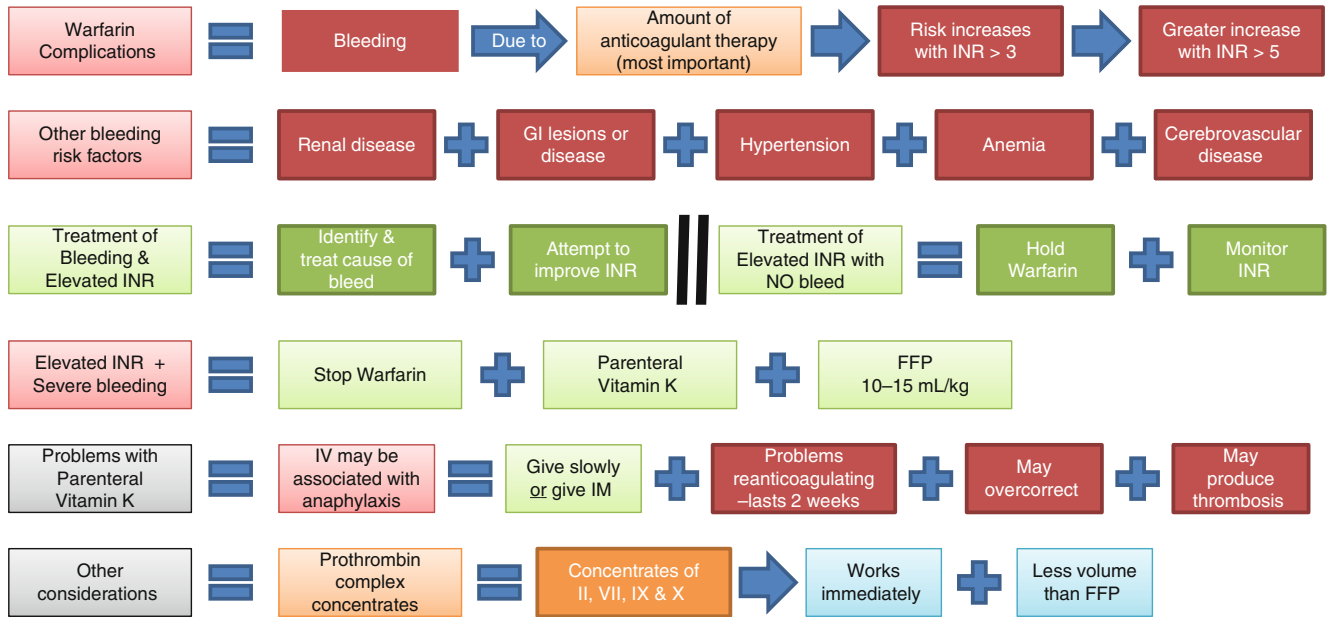


Anticoagulants

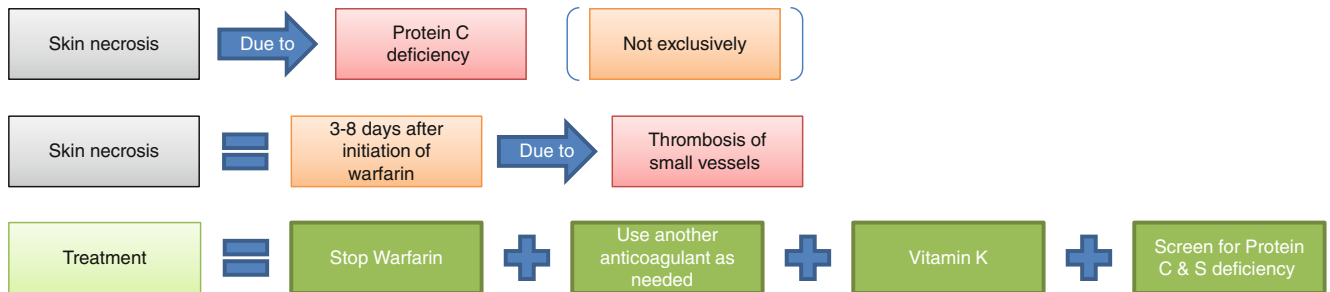
Introduction: Warfarin



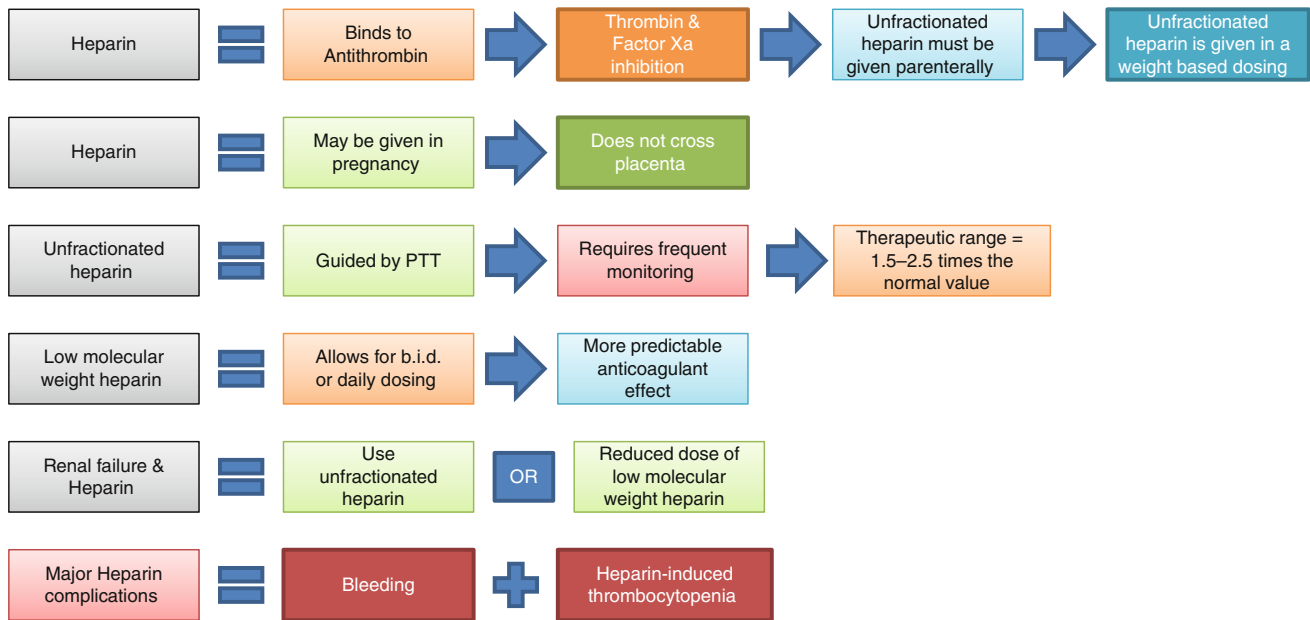
Bleeding from Warfarin



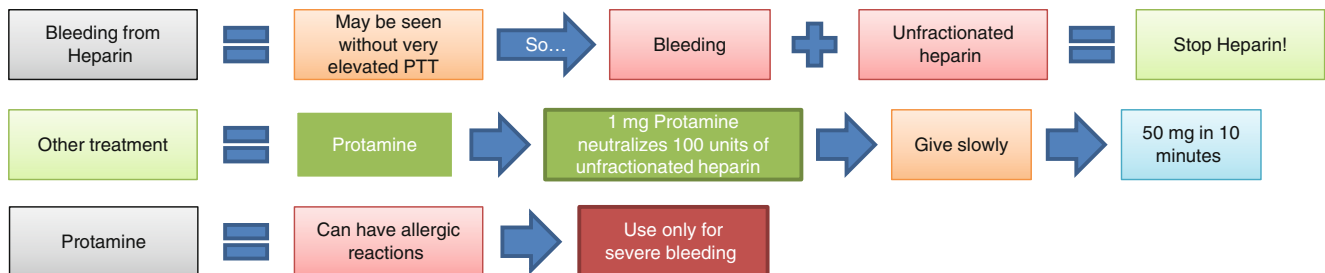
Skin Necrosis from Warfarin



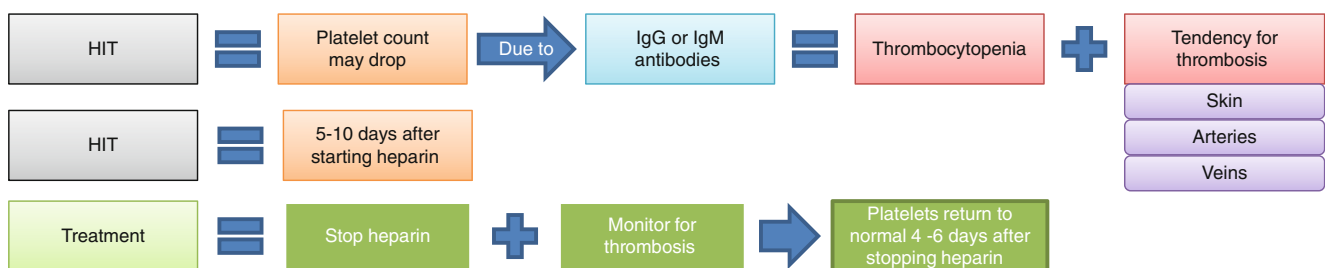
Introduction: Heparin



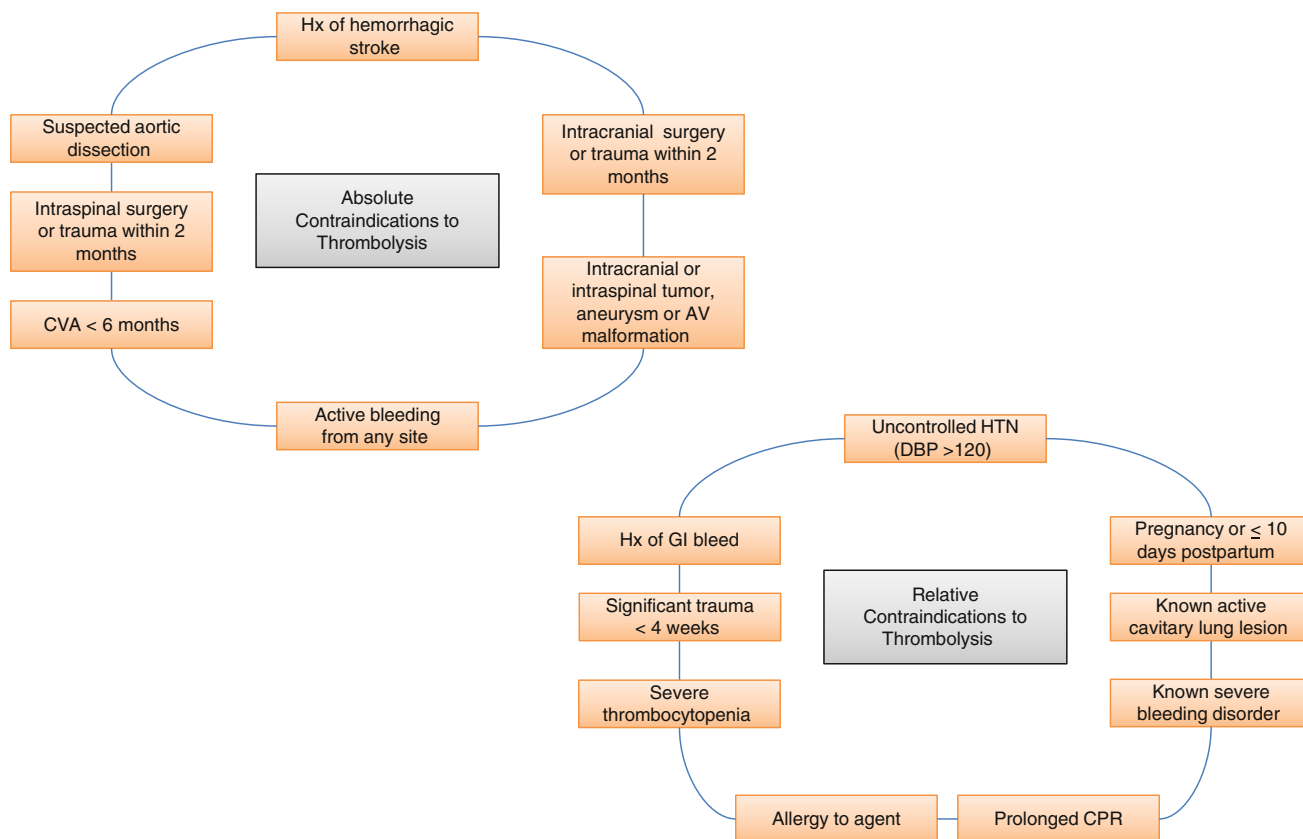
Bleeding from Heparin



Heparin-Induced Thrombocytopenia (HIT)

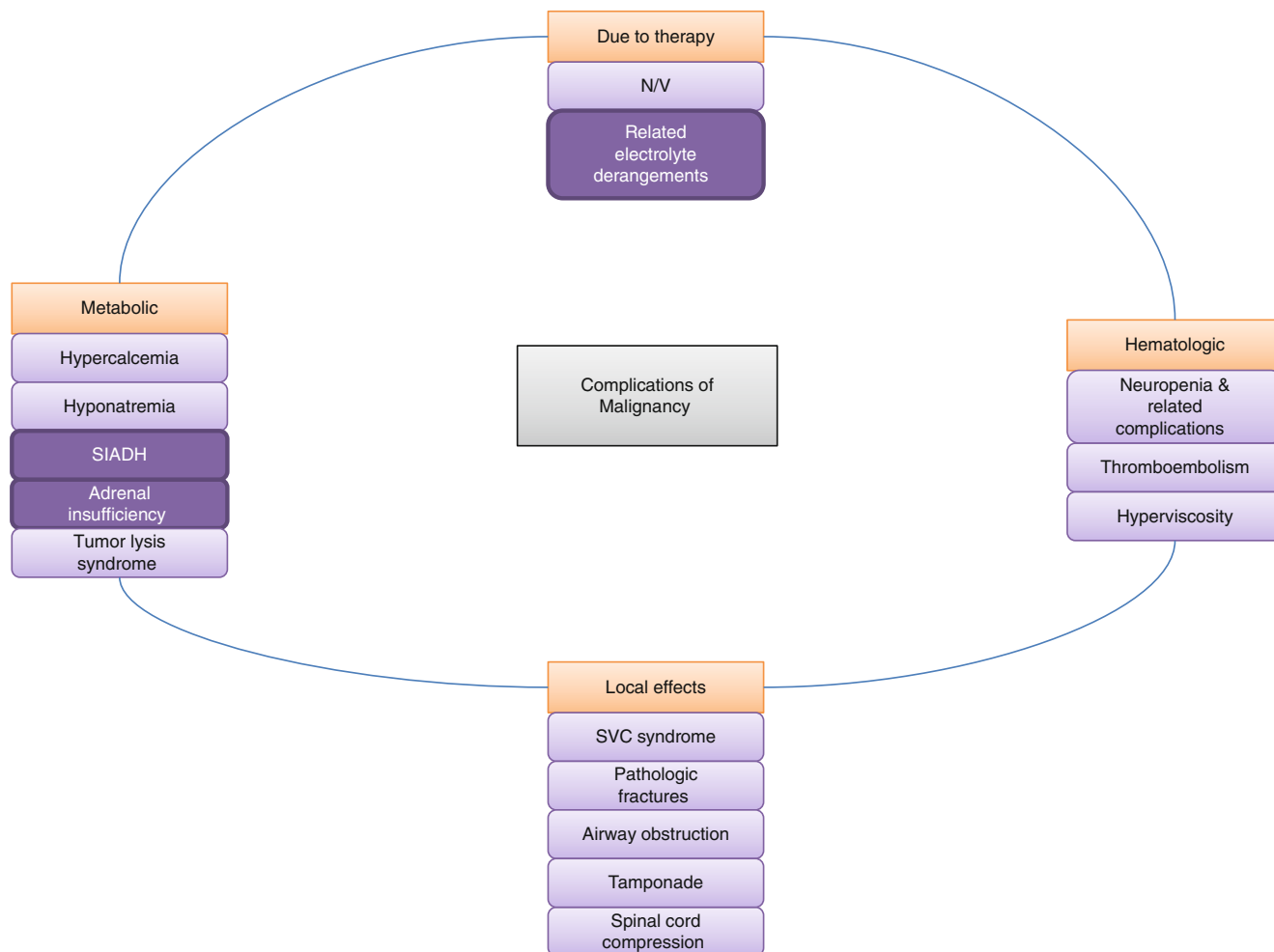


Absolute and Relative Contraindications to Thrombolysis

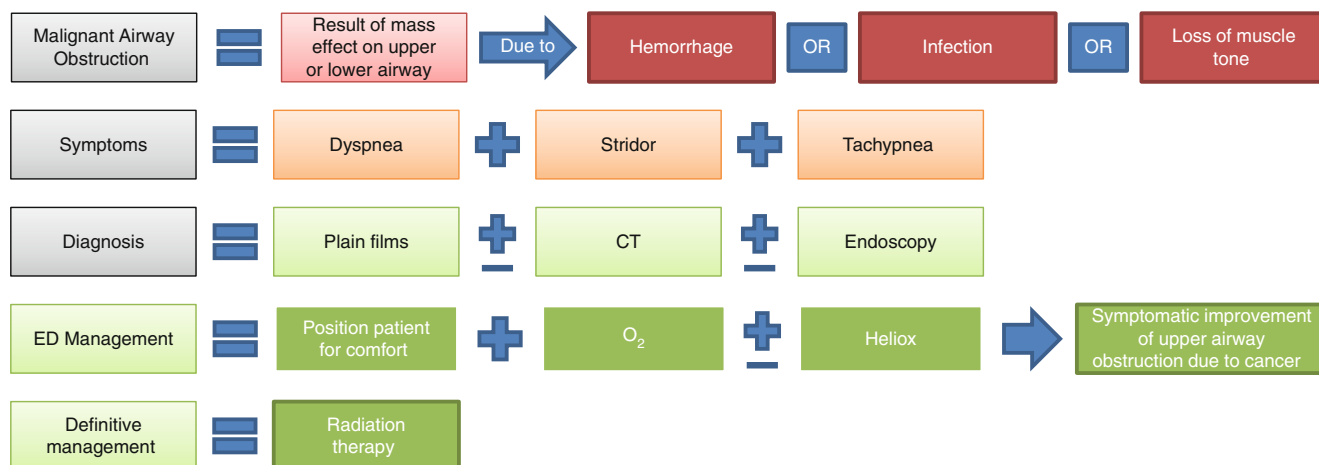


Complications of Malignancy

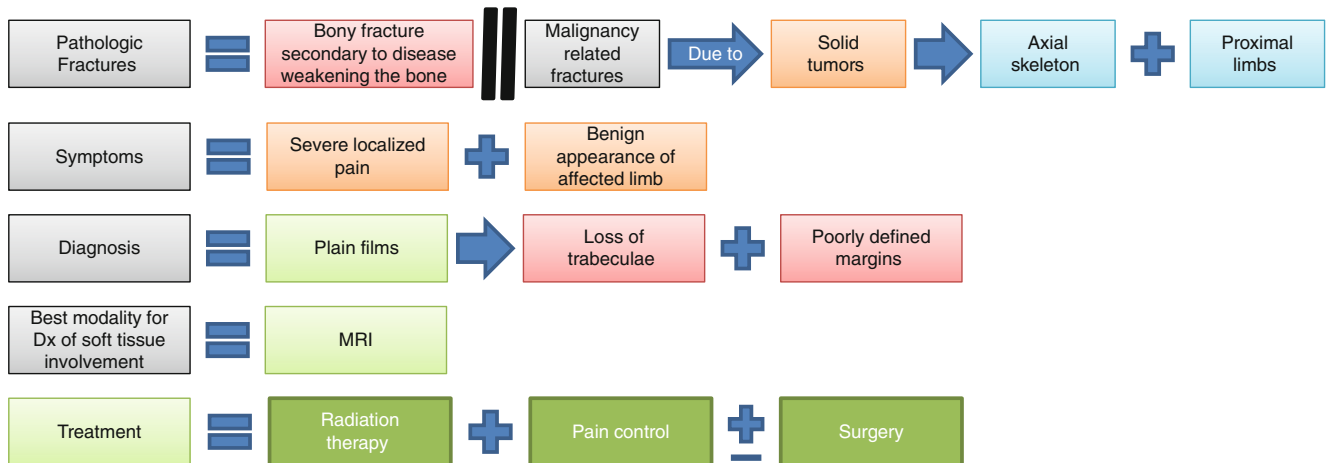
Introduction



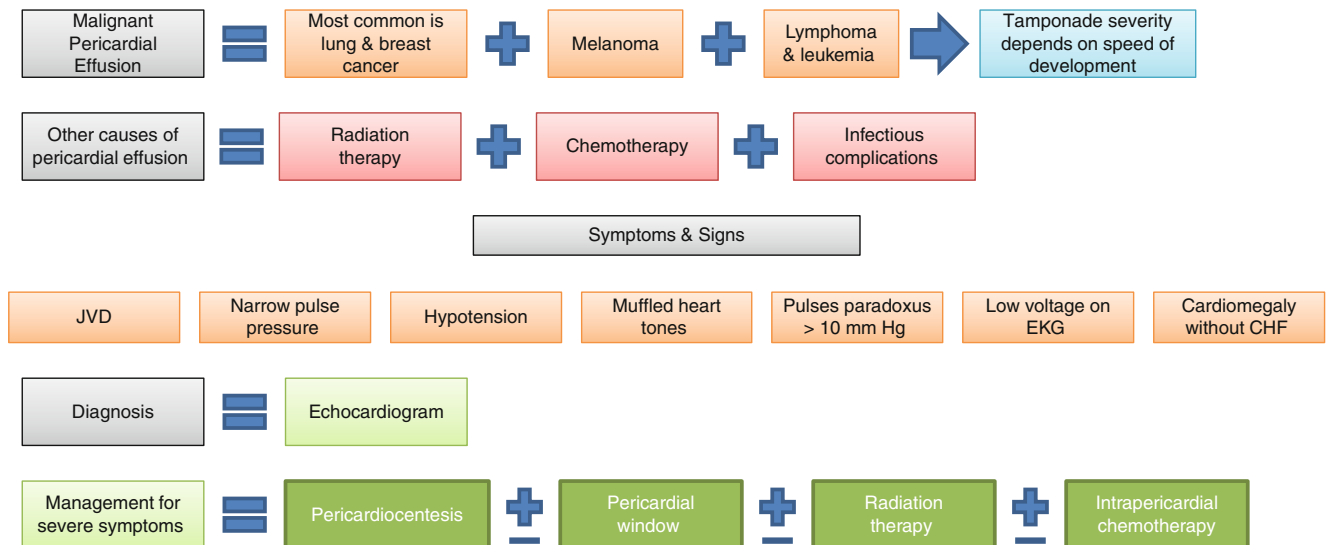
Malignant Airway Obstruction



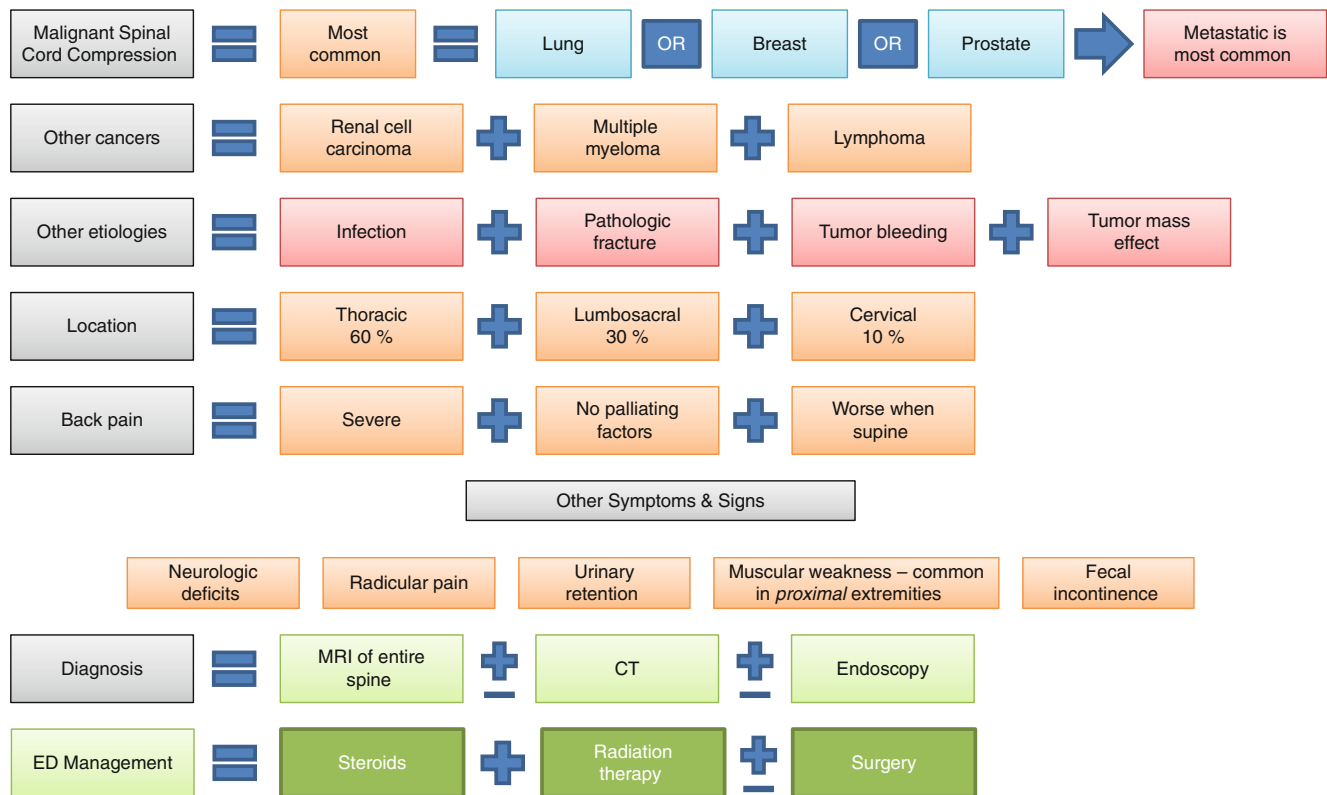
Pathologic Fractures from Bone Metastases



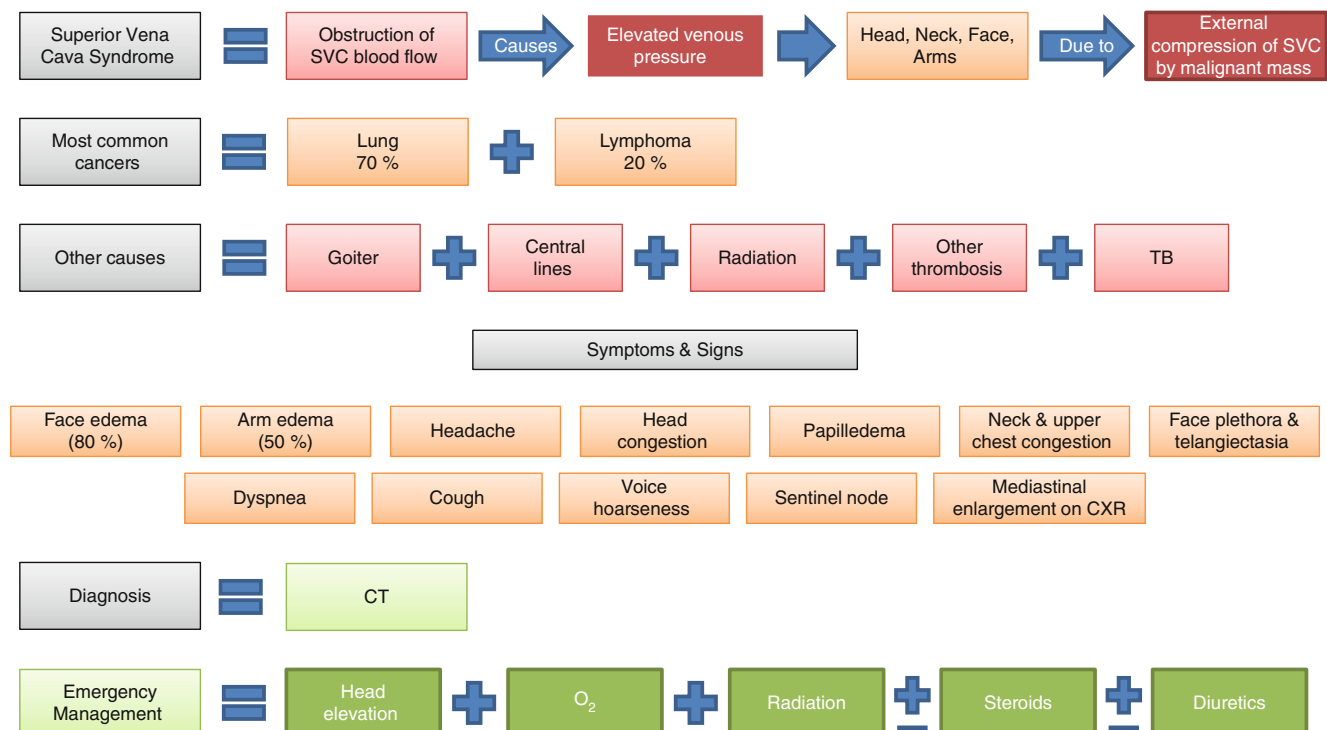
Malignant Pericardial Effusion and Tamponade



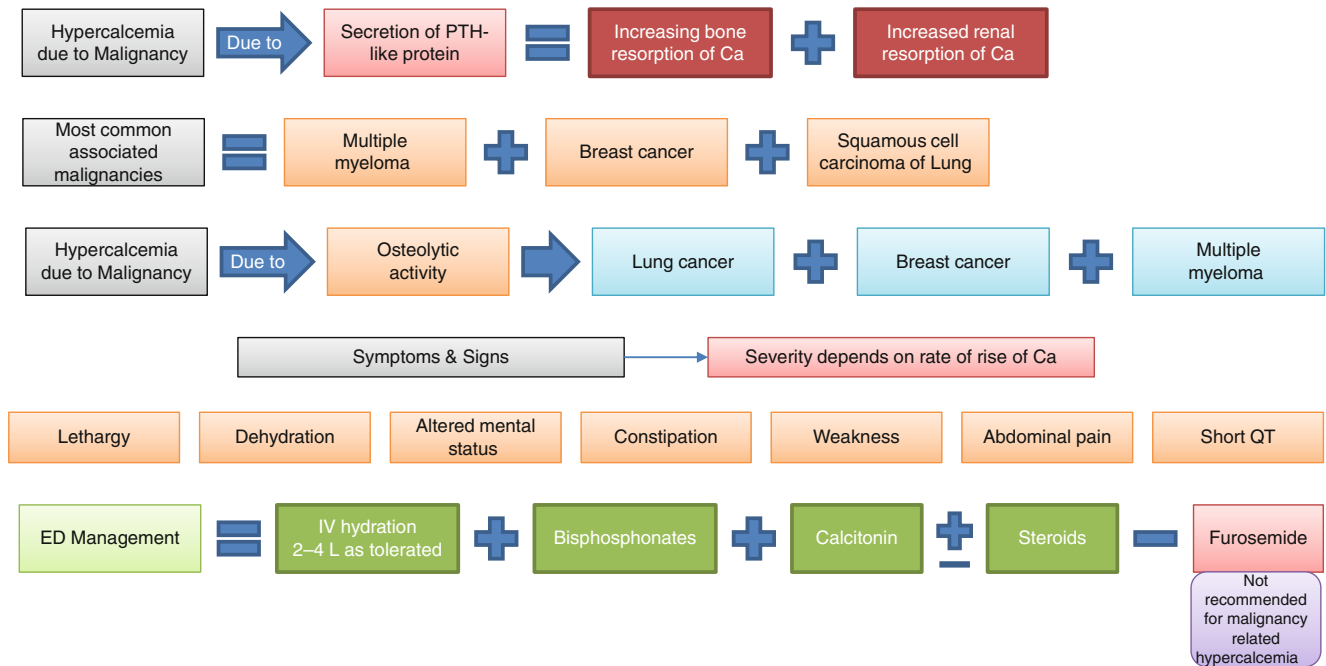
Malignant Spinal Cord Compression



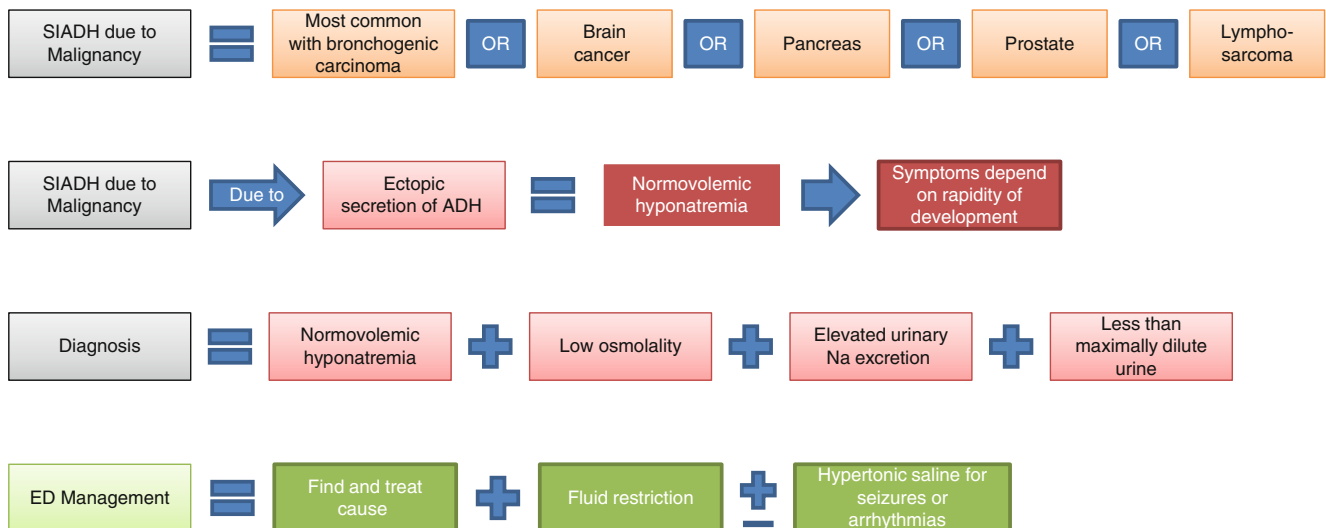
Superior Vena Cava Syndrome



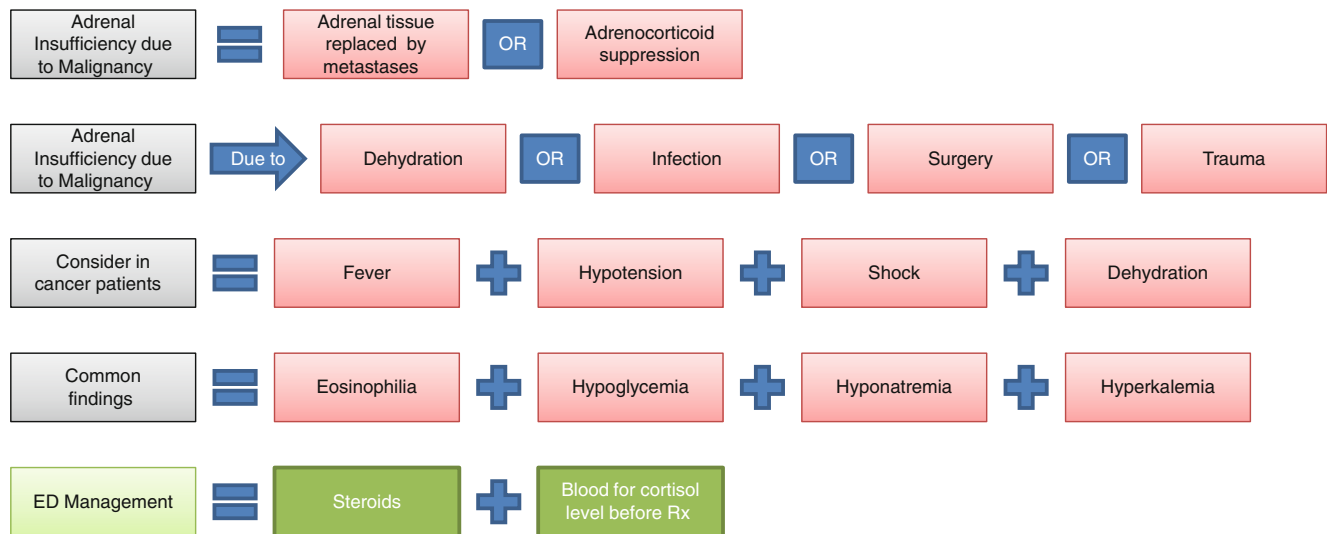
Hypercalcemia Due to Malignancy



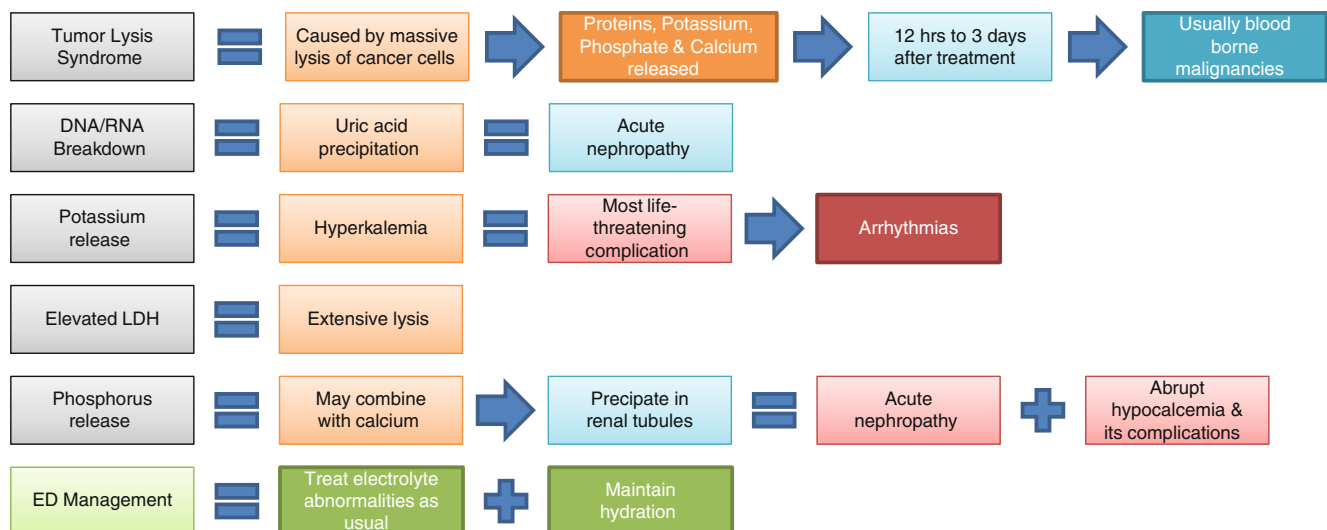
SIADH Due to Malignancy



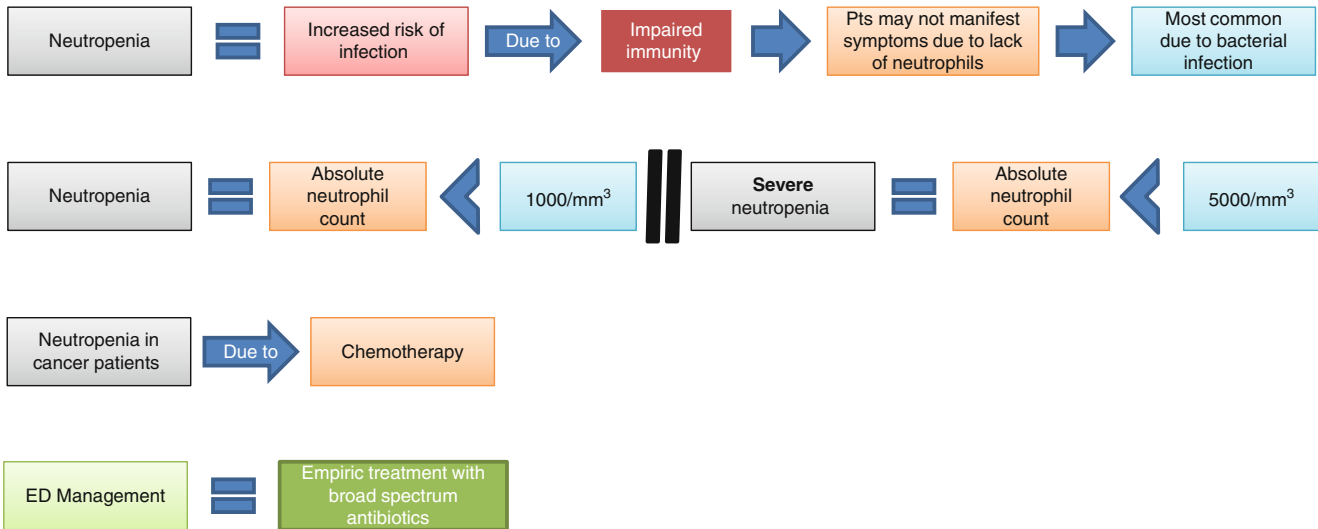
Adrenal Insufficiency Due to Malignancy



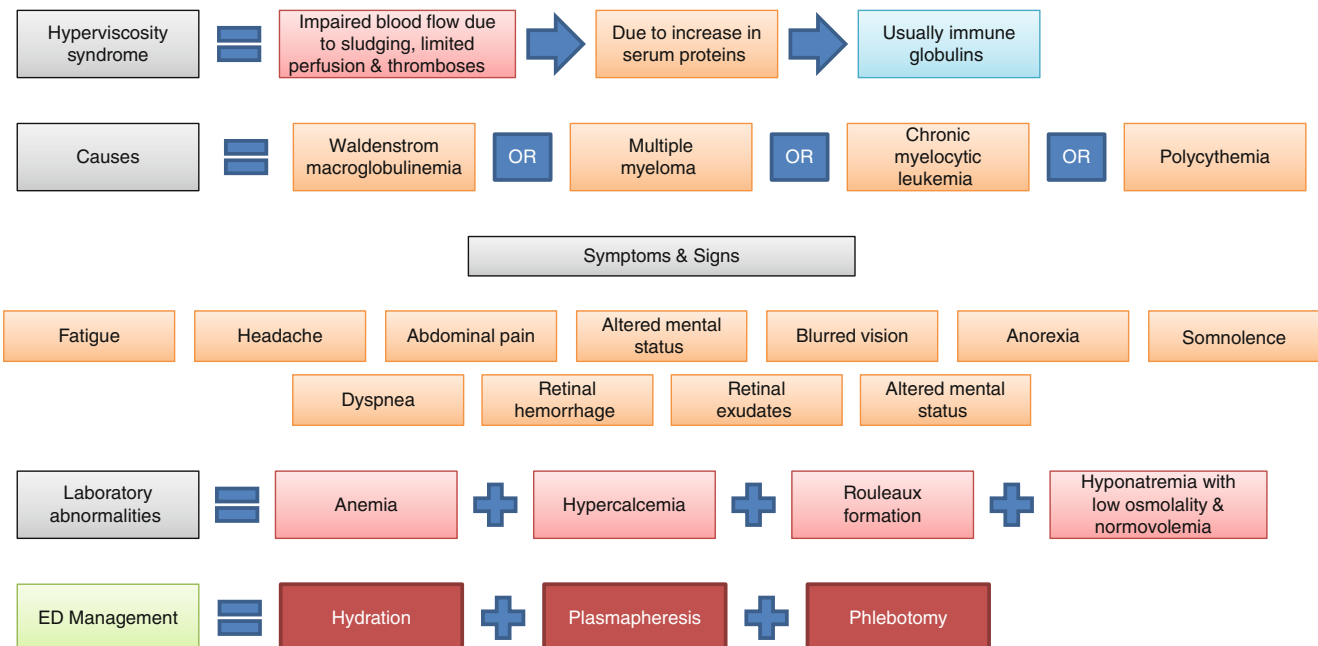
Tumor Lysis Syndrome



Febrile Neutropenia



Hyperviscosity Syndrome Due to Malignancy



Disorders Affecting the Skin

Bobby Desai

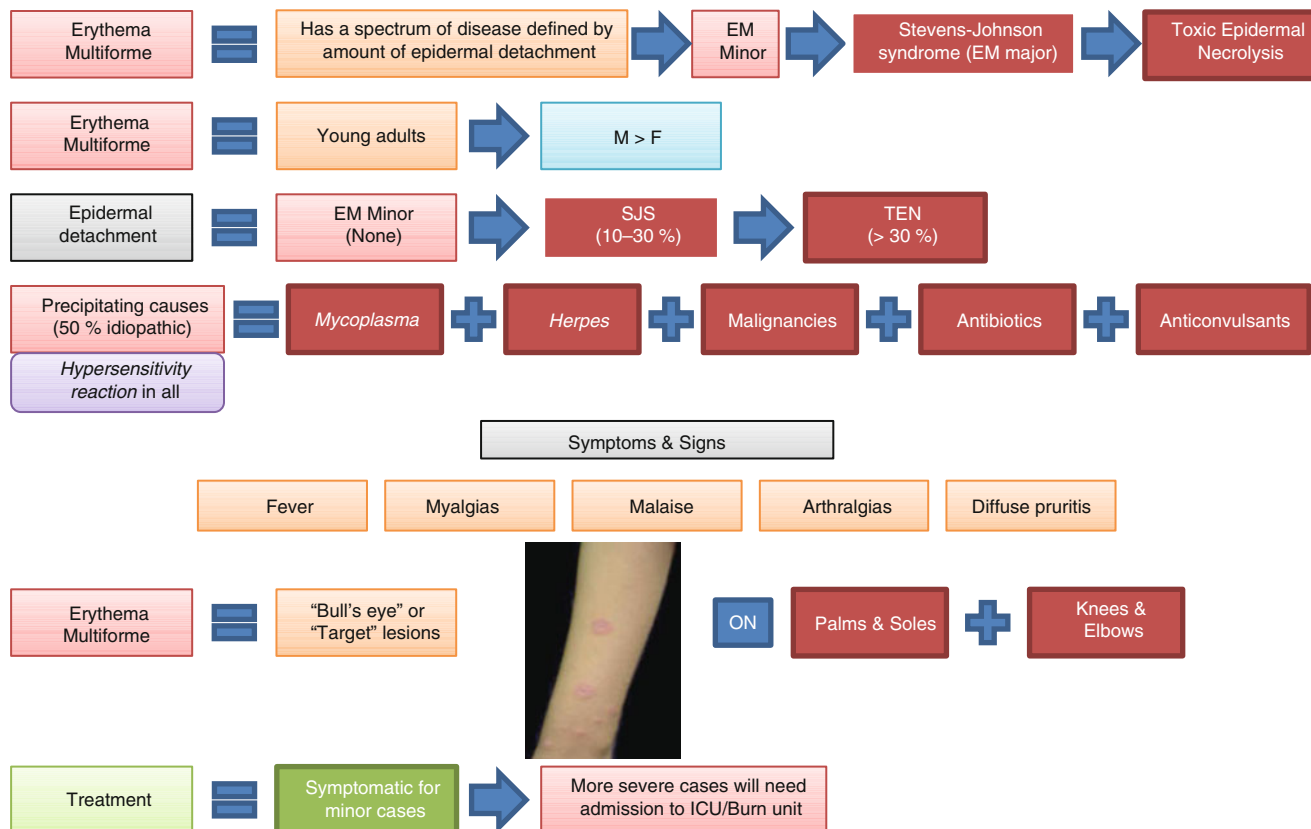
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B. Desai, MD, MEd
Department of Emergency Medicine, University of Florida,
Gainesville, FL, USA
e-mail: bdesai@ufl.edu

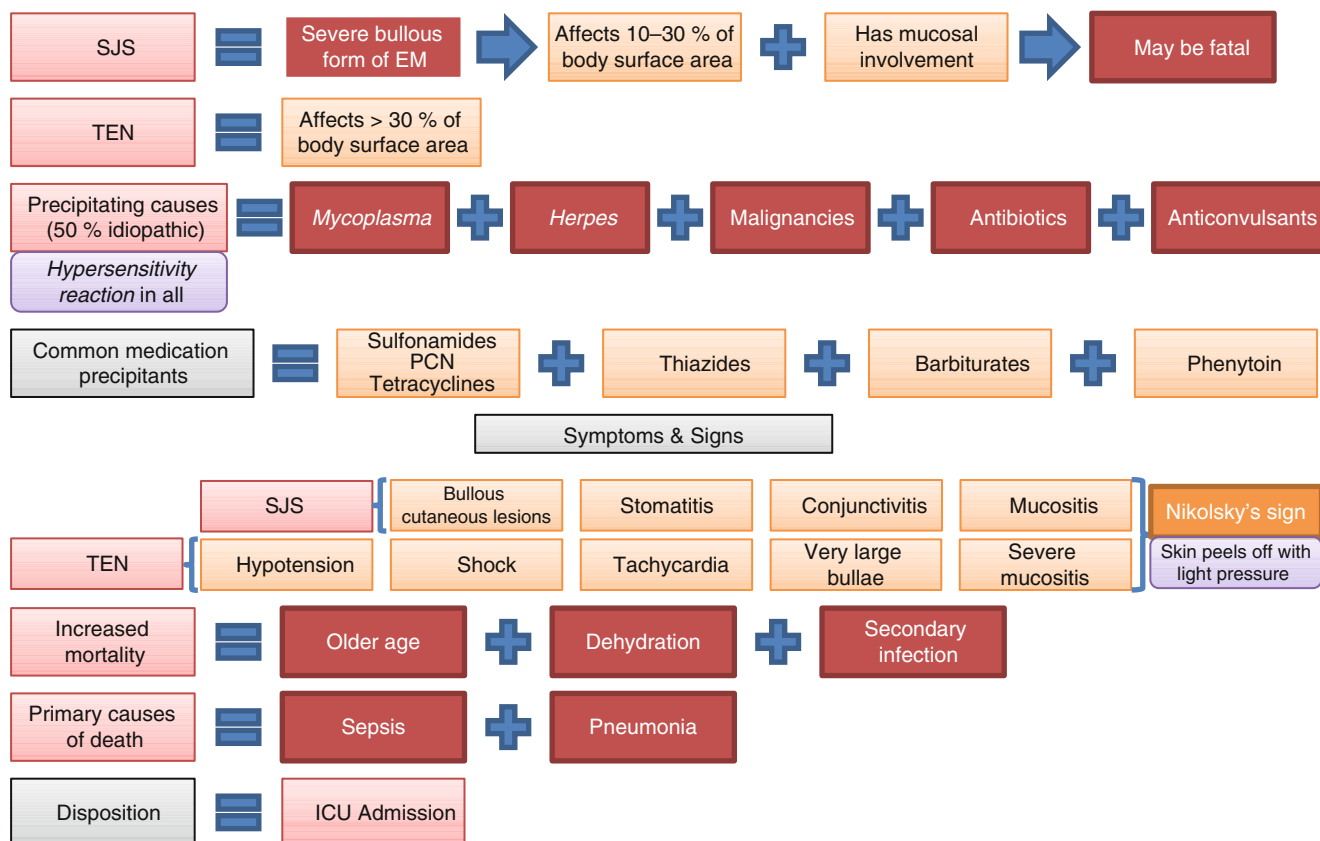
Generalized Skin Rashes and Disorders

Erythema Multiforme



Bottom center image (Reprinted from Zaidi Z, Lanigan SW. Vasculitis, common erythemas, and lymphatic disorders. In: Zaidi Z, Lanigan SW, editors. *Dermatology in clinical practice*. London: Springer; 2010. p. 253–70. With permission from Springer Verlag)

Stevens-Johnson Syndrome (SJS) and Toxic Epidermal Necrolysis (TEN)

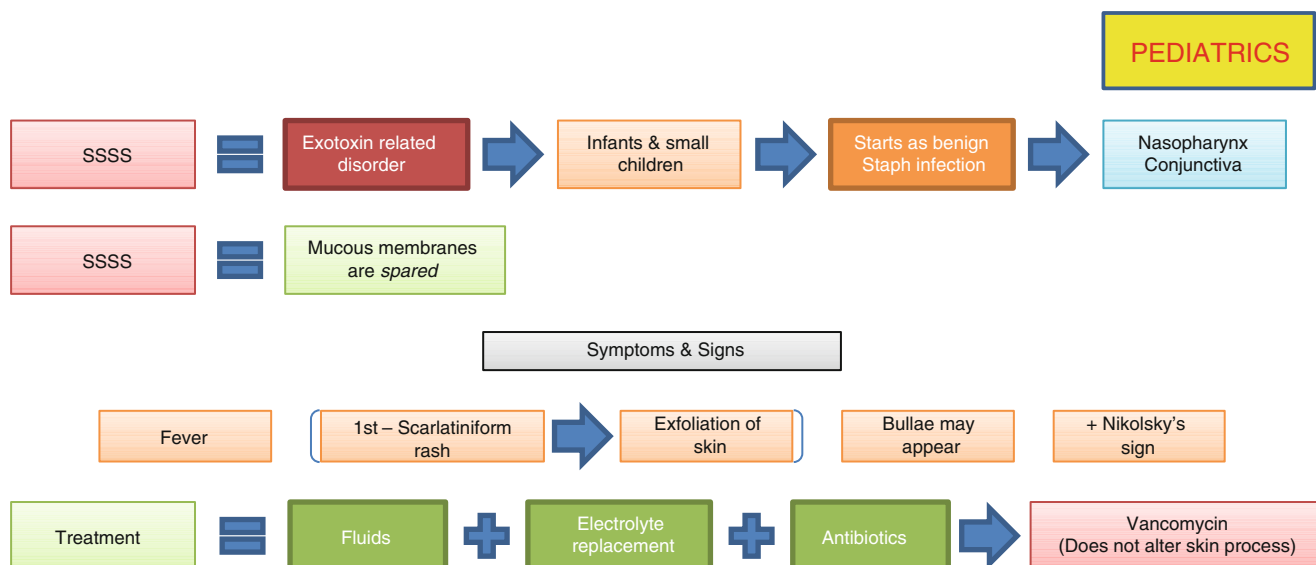


PEDIATRICS



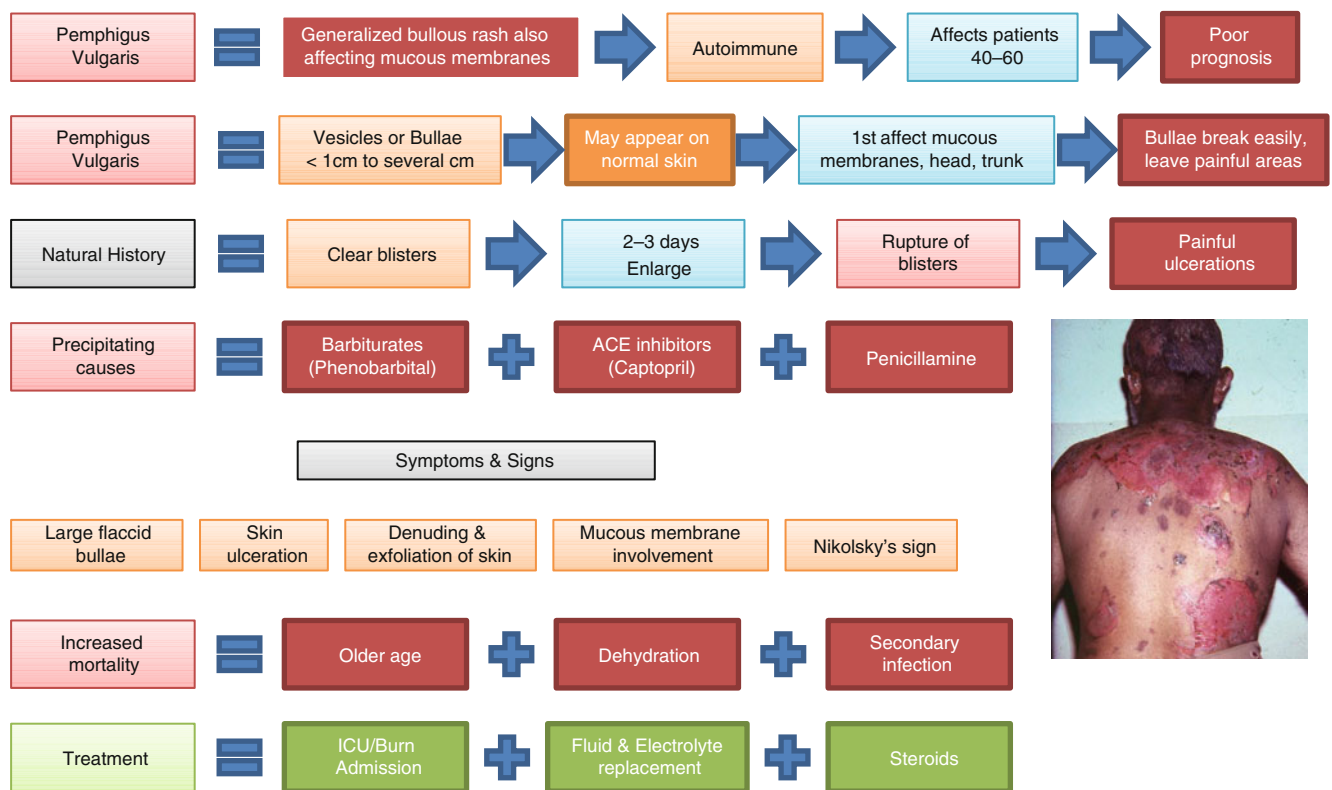
Right side image (Reprinted from Zaidi Z, Lanigan SW. Exanthems and Hypersensitivity Syndromes. In: Zaidi Z, Lanigan SW, editors. Dermatology in clinical practice. London: Springer; 2010. p. 271–80. With permission from Springer Verlag)

Staphylococcal Scalded Skin Syndrome (SSSS)



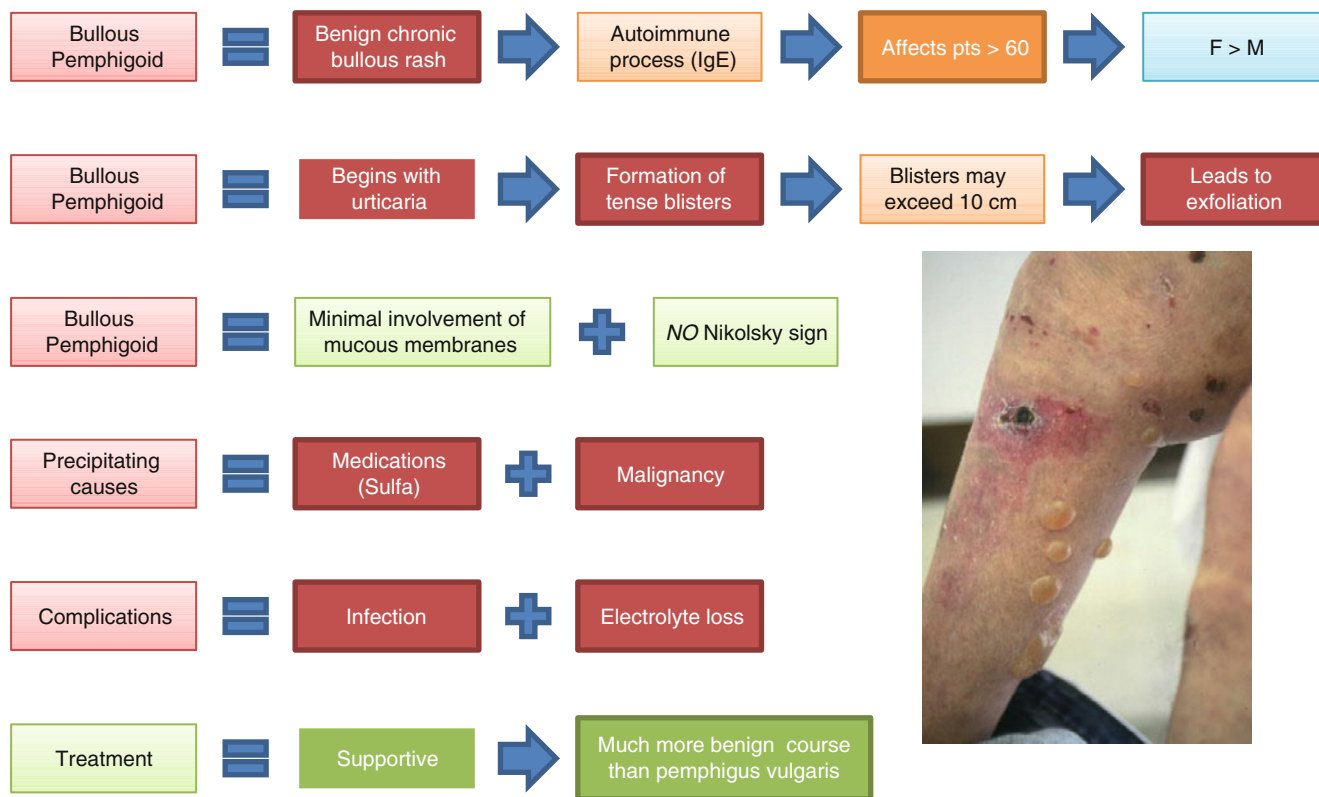
Bottom center image (Reprinted from Zaidi Z, Lanigan SW. Exanthems and hypersensitivity syndromes. In: Zaidi Z, Lanigan SW, editors. Dermatology in clinical practice. London: Springer; 2010. p. 271–80. With permission from Springer Verlag)

Pemphigus Vulgaris



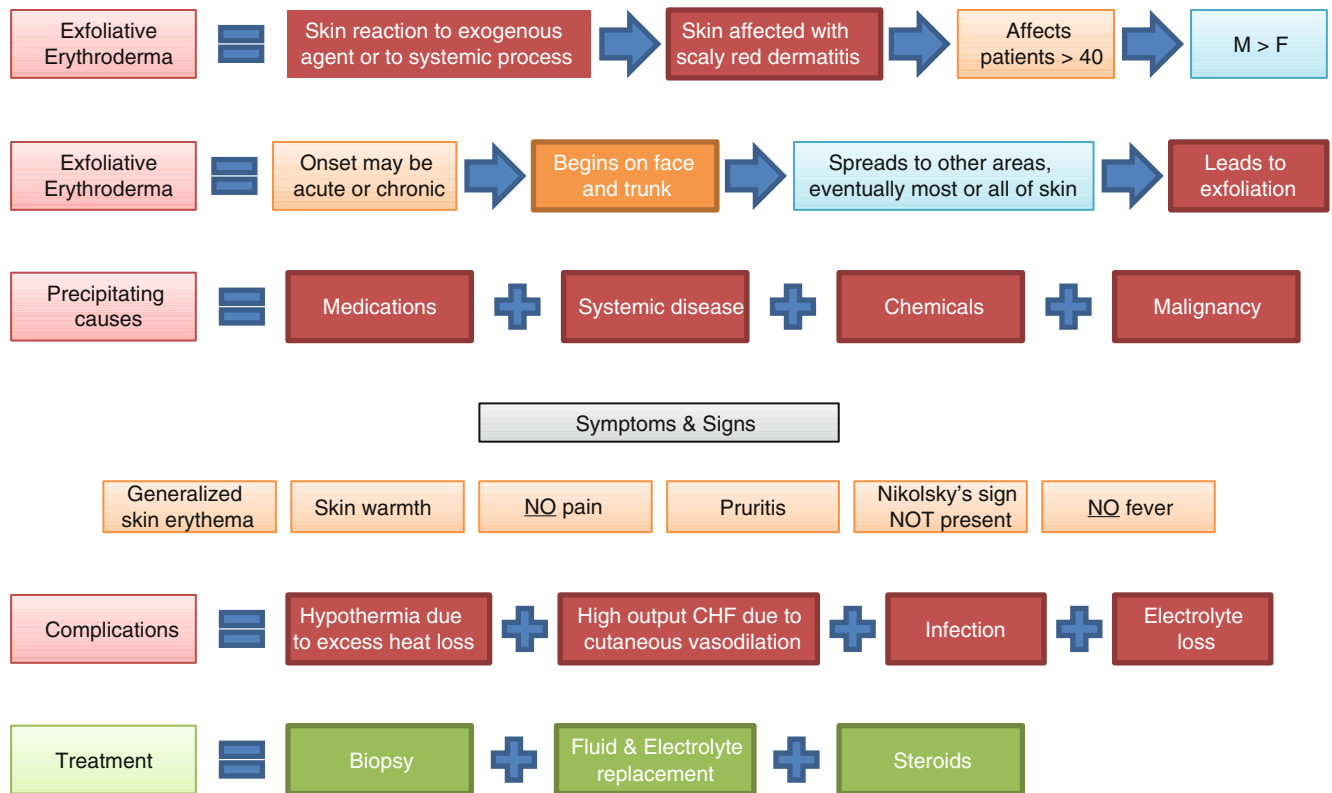
Right side image (Reprinted from Zaidi Z, Lanigan SW. Bullous disorders: autoimmune and childhood bullous dermatoses. In: Zaidi Z, Lanigan SW, editors. Dermatology in clinical practice. London: Springer; 2010. p. 233–52. With permission from Springer Verlag)

Bullous Pemphigoid

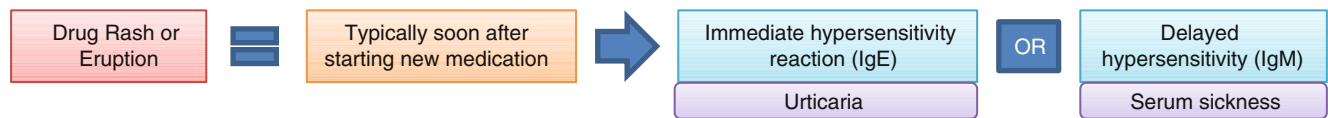


Right side image (Reprinted from Cashman MW, Doshi D, Krishnamurthy K. Vesiculobullous dermatoses. In: Buka B, Uliasz A, Krishnamurthy K, editors. *Buka's emergencies in dermatology*. New York: Springer; 2013. p. 147–73. With permission from Springer Science+Business Media)

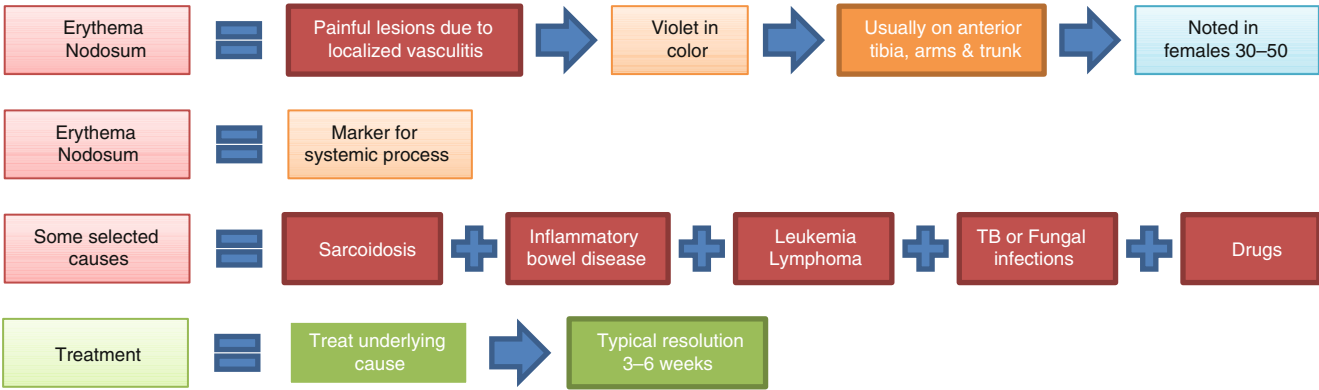
Exfoliative Dermatitis (Erythroderma)



Drug Rash or Eruption

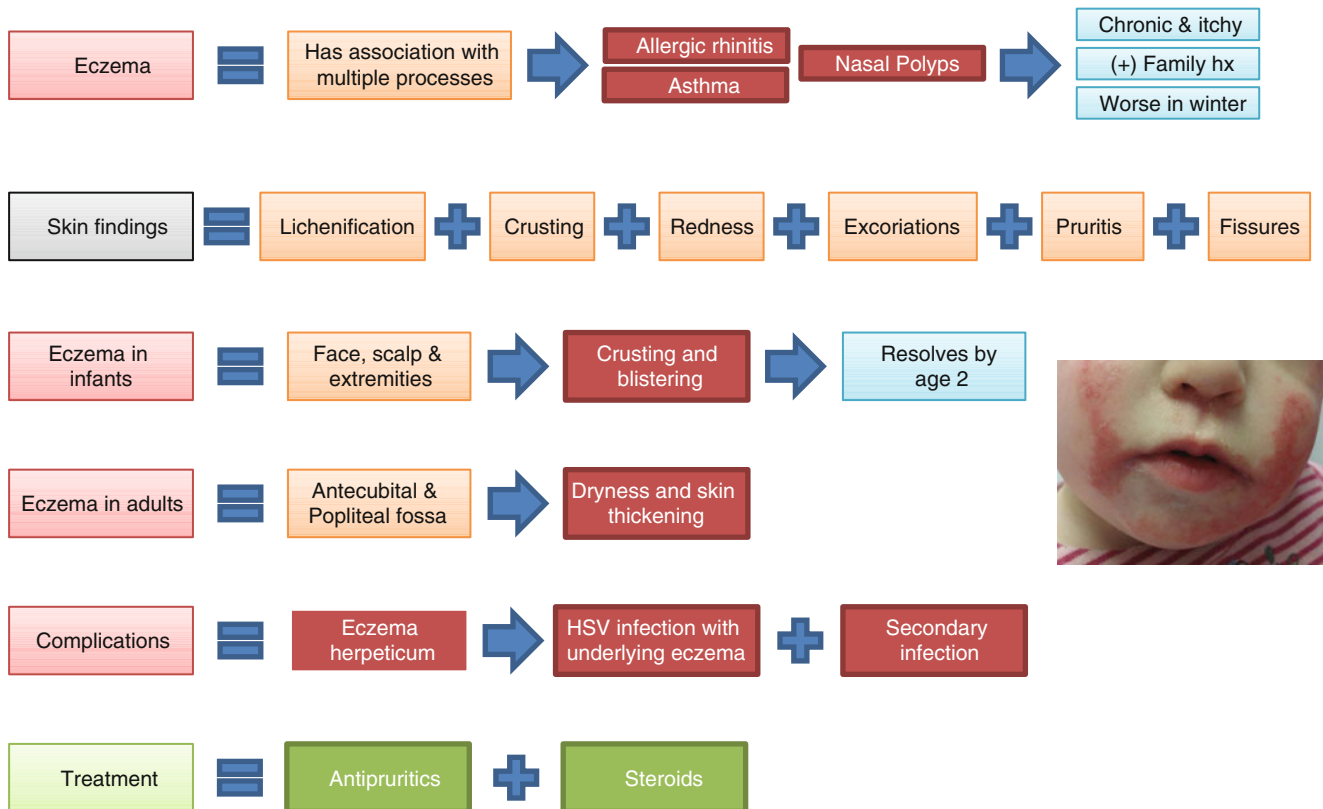


Erythema Nodosum



Bottom center image (Reprinted from Vázquez-Roque MI, De Jesús-Monge WE. Cutaneous manifestations of gastrointestinal diseases. In: Sánchez NP, editors. Atlas of dermatology in internal medicine. New York: Springer; 2012. p. 41–51. With permission from Springer Science+Business Media)

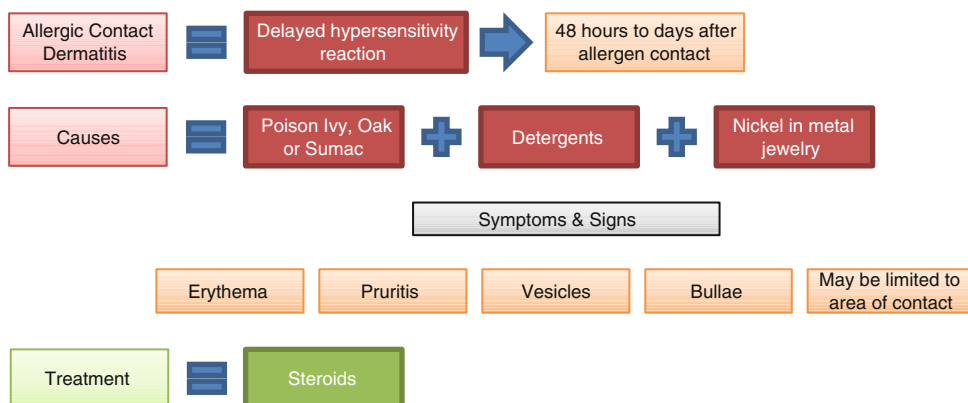
Eczema



Right center image (Reprinted from Silverberg NB. Eczematous diseases. In: Silverberg NB, editor. Atlas of pediatric cutaneous biodiversity: comparative dermatologic atlas of pediatric skin of all colors.

New York: Springer; 2012. p. 69–88. With permission from Springer Science+Business Media)

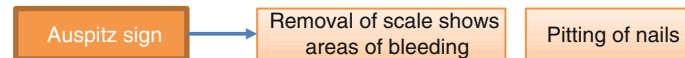
Allergic Contact Dermatitis



Psoriasis



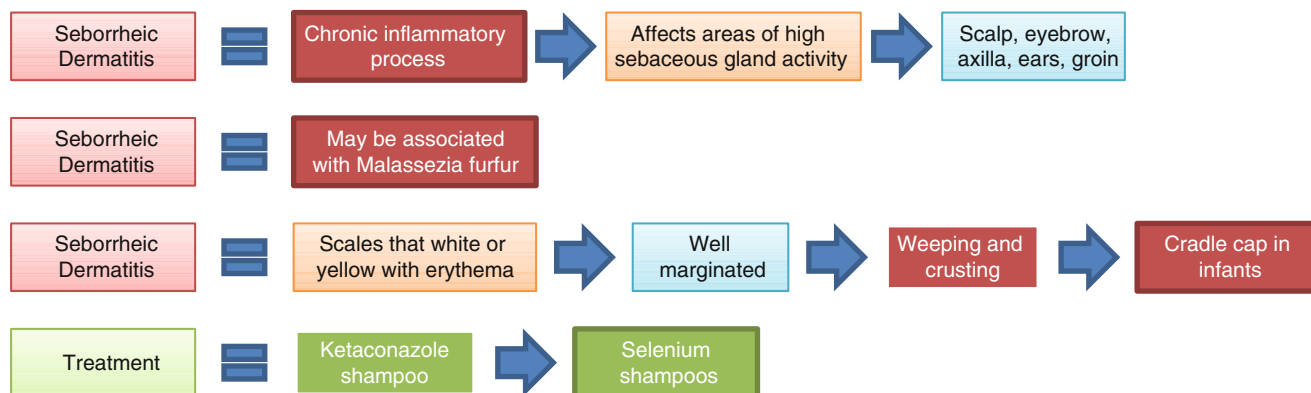
Symptoms & Signs



Bottom center image (Reprinted from Norman RA, Young, Jr. EM. Psoriasis. In: Norman RA, Young EM Jr, editors. Atlas of geriatric dermatology. London: Springer; 2014. p. 83–95. With permission from Springer Verlag)

Seborrheic Dermatitis

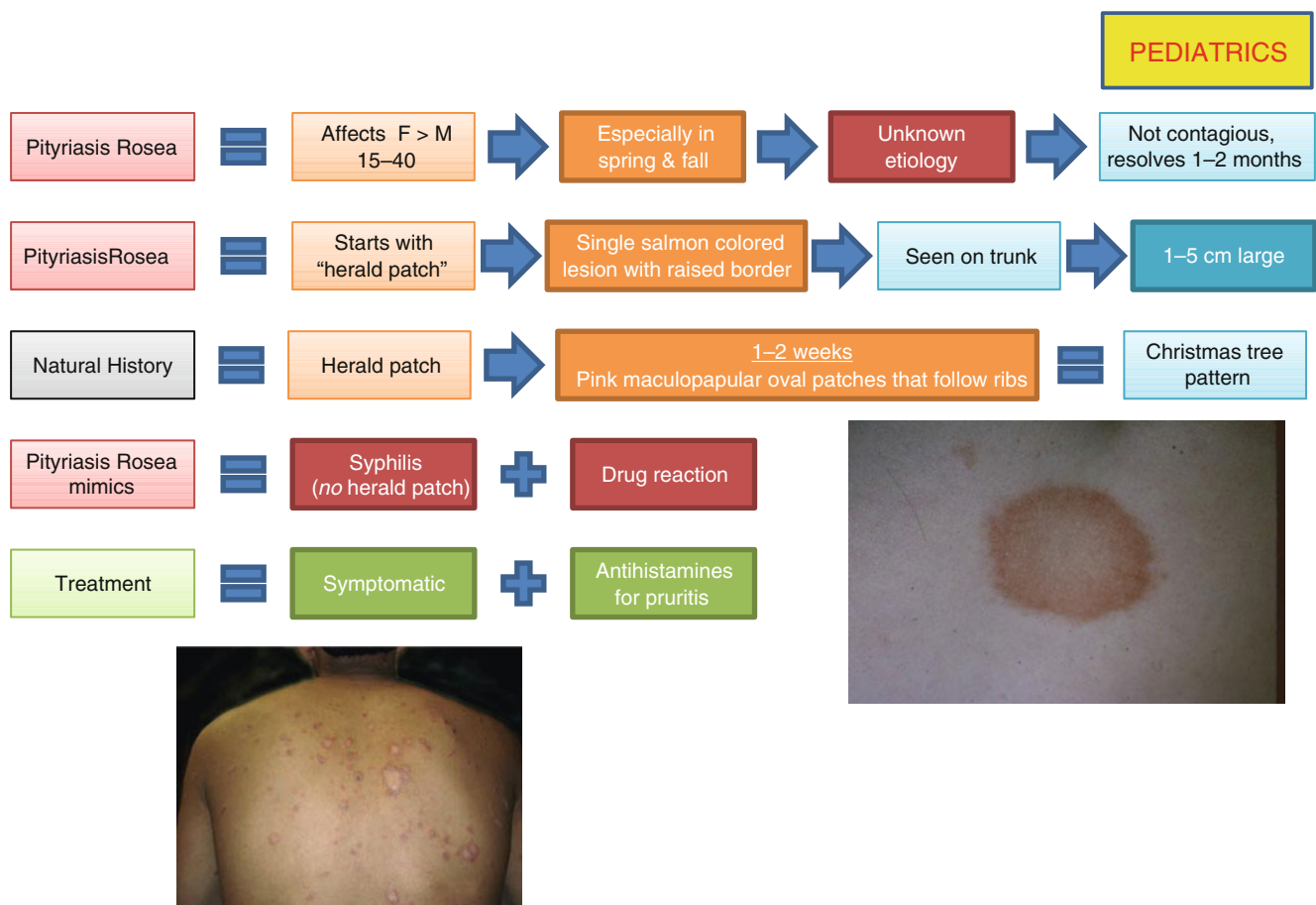
PEDIATRICS



Bottom center image (Reprinted from Silverberg NB. Eczematous diseases. In: Silverberg NB, editor. Atlas of pediatric cutaneous biodiversity: comparative dermatologic atlas of pediatric skin of all colors.

New York: Springer; 2012. p. 69–88. With permission from Springer Science + Business Media)

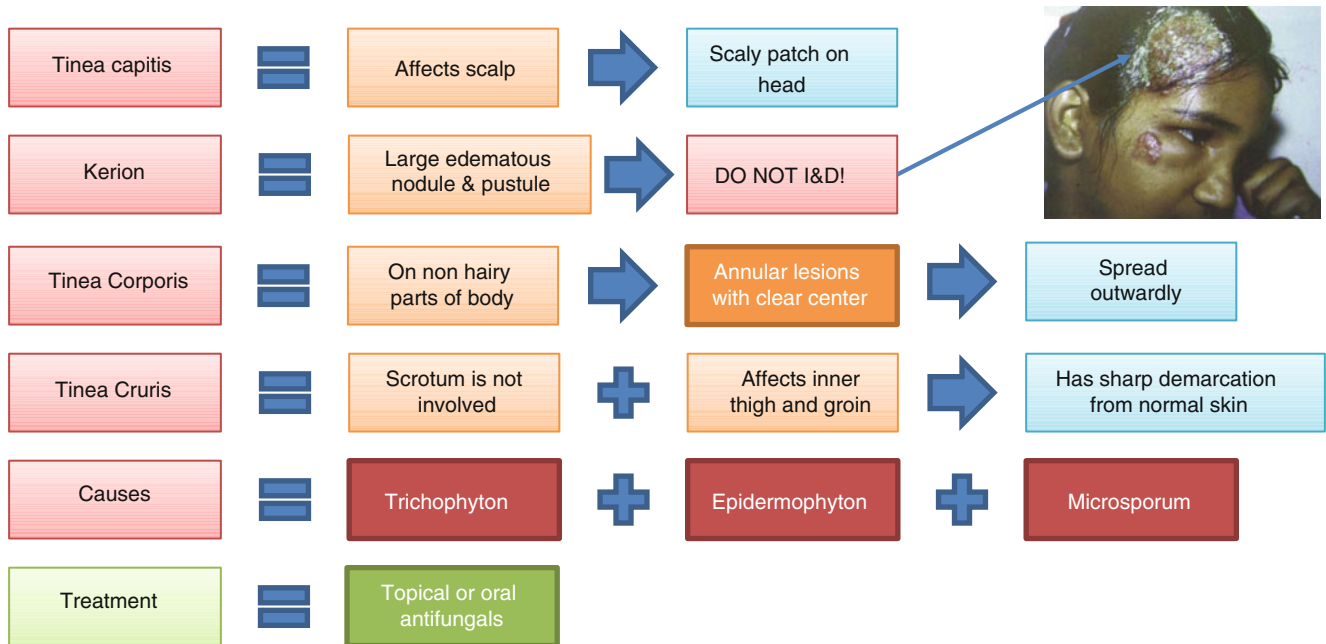
Pityriasis Rosea



Left side image (Reprinted from Zaidi Z, Lanigan SW. Keratinizing and papulosquamous disorders. In: Zaidi Z, Lanigan SW, editors. Dermatology in clinical practice. London: Springer; 2010. p. 179–209. With permission from Springer Verlag)

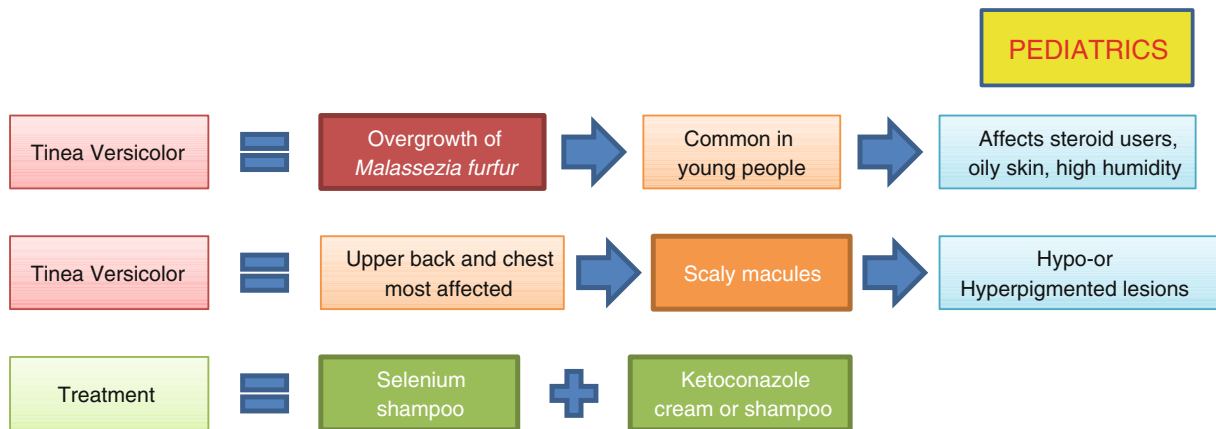
Right side image (Reprinted from Silverberg NB. Papulosquamous disorders. In: Silverberg NB, editor. Atlas of pediatric cutaneous biodiversity: comparative dermatologic atlas of pediatric skin of all colors. New York: Springer; 2012. p. 53–60. With permission from Springer Science + Business Media)

Dermatophyte Infections



Right side image (Reprinted from Zaidi Z, Lanigan SW. Superficial fungal infections. In: Zaidi Z, Lanigan SW, editors. Dermatology in clinical practice. London: Springer; 2010. p. 73–99. With permission from Springer Verlag)

Tinea Versicolor

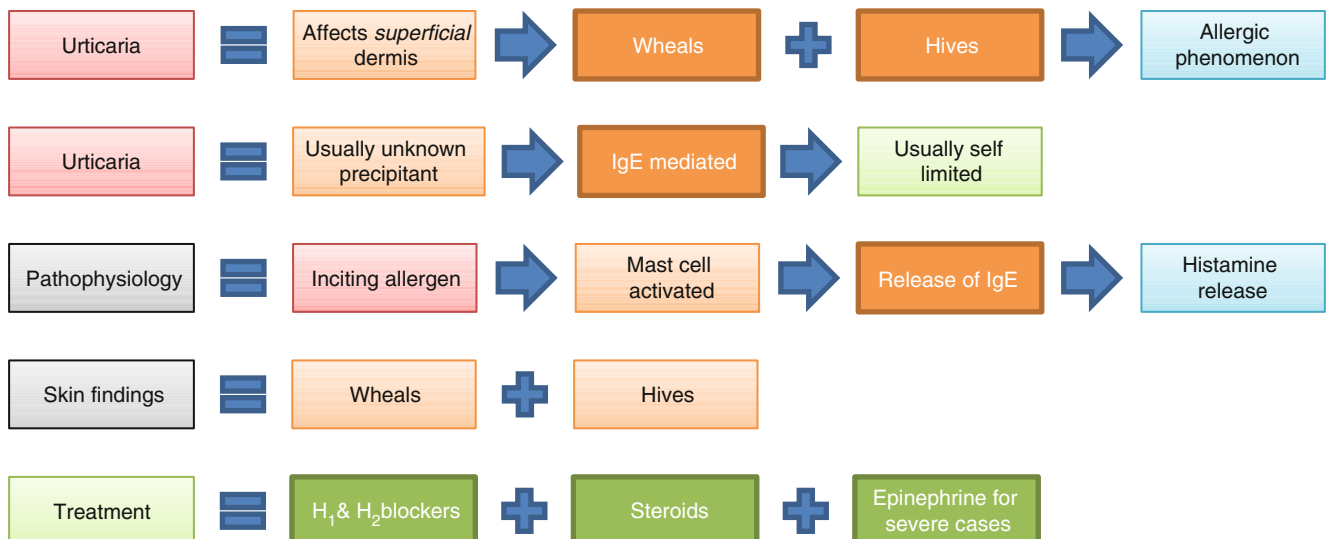


Bottom center image (Reprinted from Silverberg NB. Cutaneous infections. In: Silverberg NB, editor. Atlas of pediatric cutaneous biodiversity: comparative dermatologic atlas of pediatric skin of all colors.

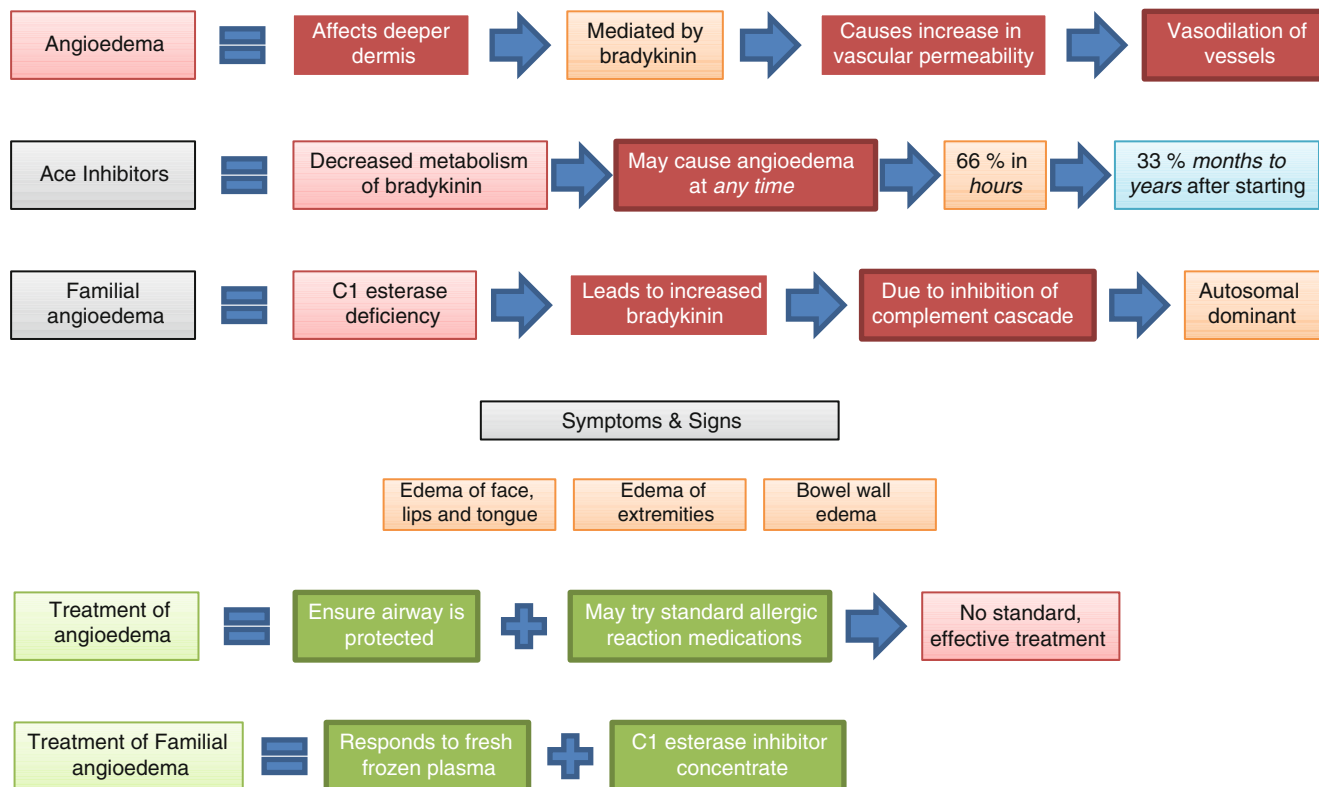
New York: Springer; 2012. p. 113–25. With permission from Springer Science + Business Media)

Allergic Processes

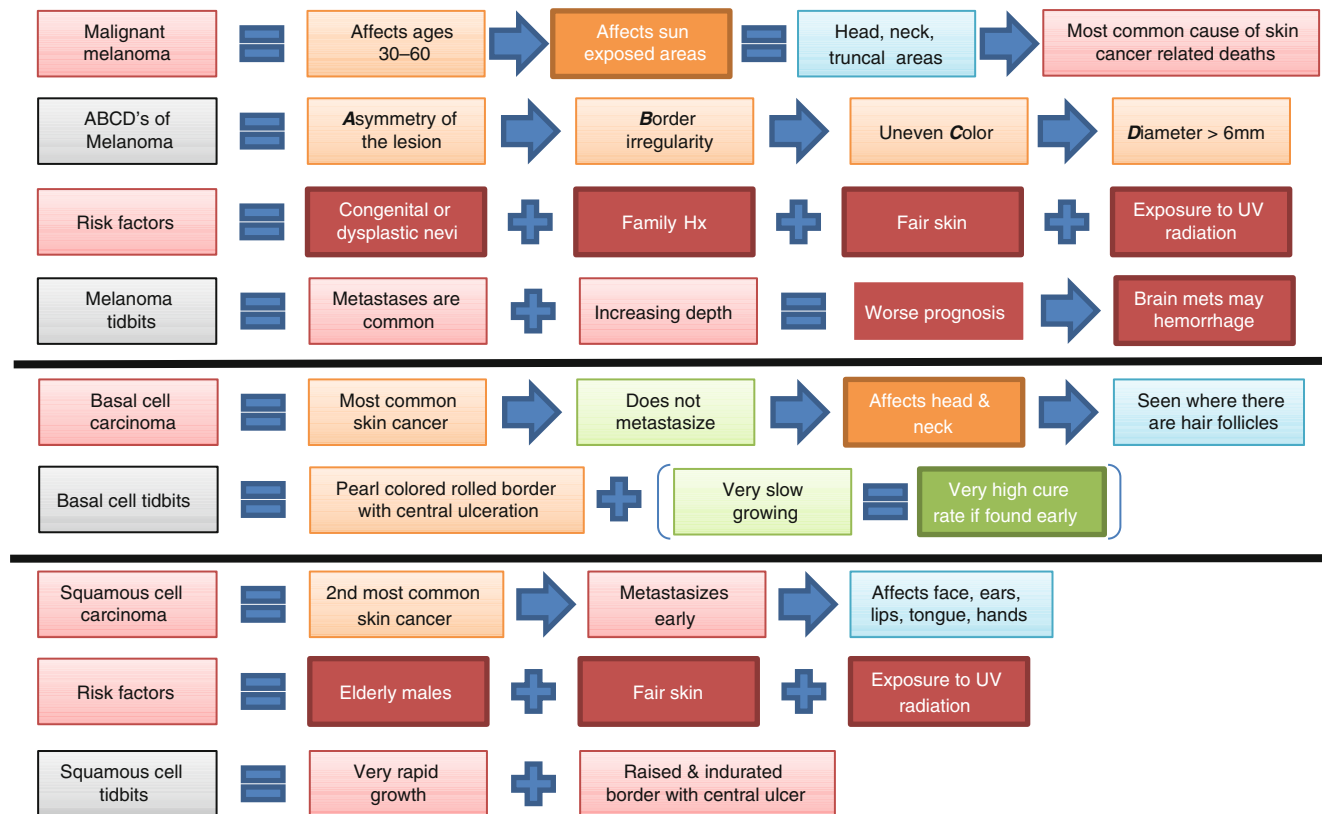
Urticaria



Angioedema

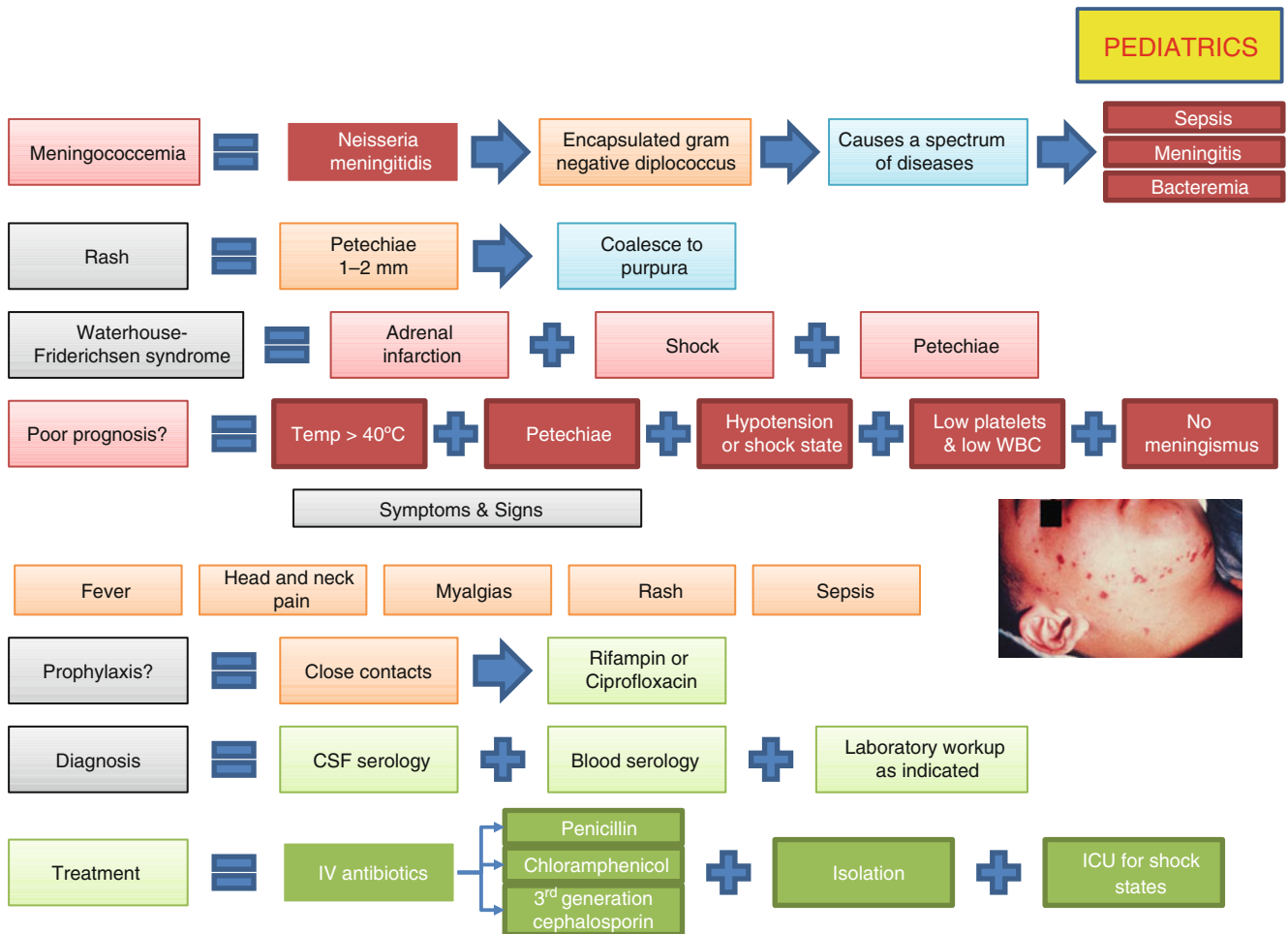


Skin Cancers



Infectious Diseases and Associated Skin Lesions

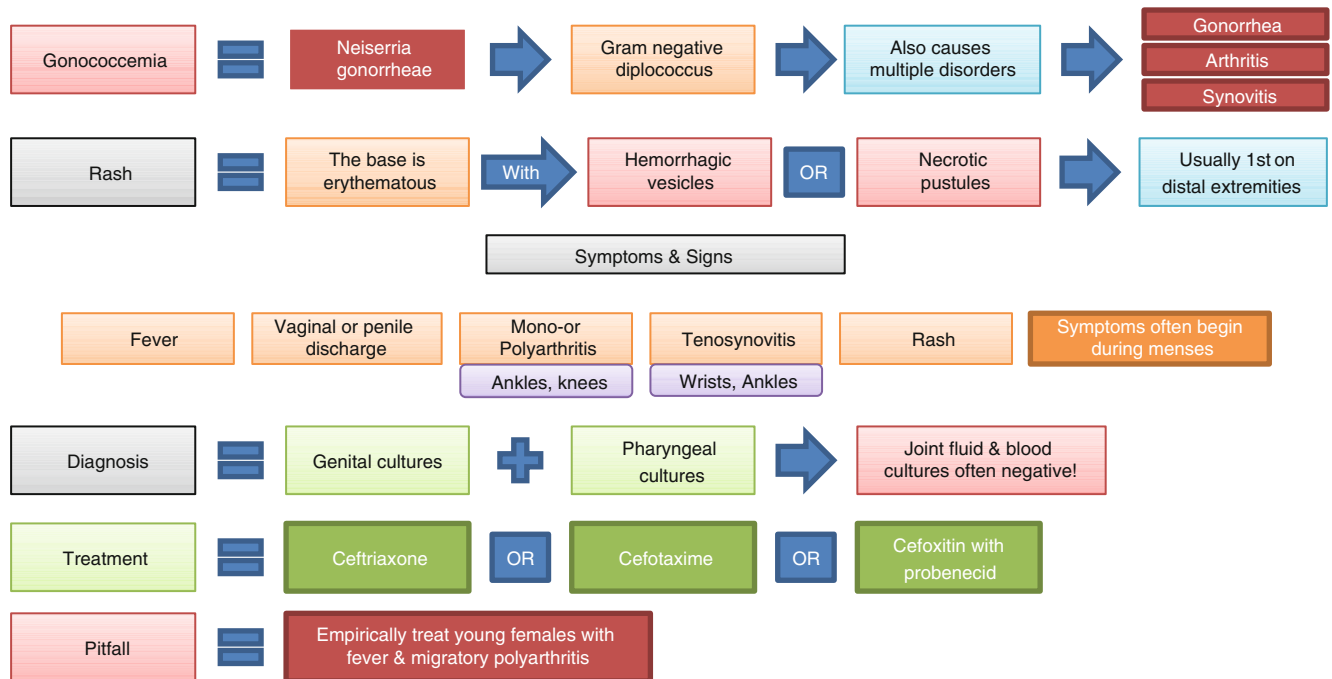
Meningococemia



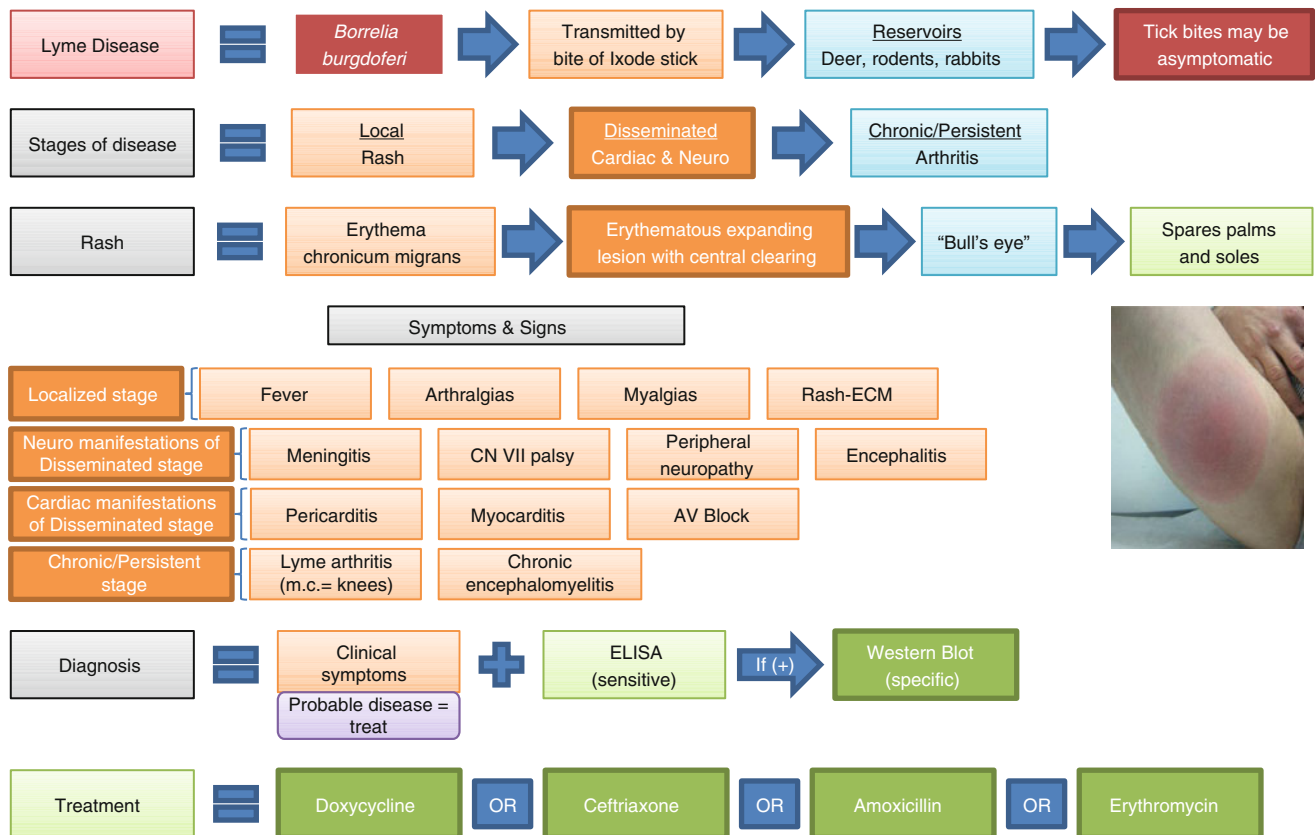
Right side image (Reprinted from Stamell E, Krishnamurthy K. Infectious emergencies in dermatology. In: Buka B, Uliasz A, Krishnamurthy K, editors. Buka's emergencies in dermatology.

New York: Springer; 2013. p. 19–41. With permission from Springer Science+Business Media)

Gonococemia and GC Arthritis

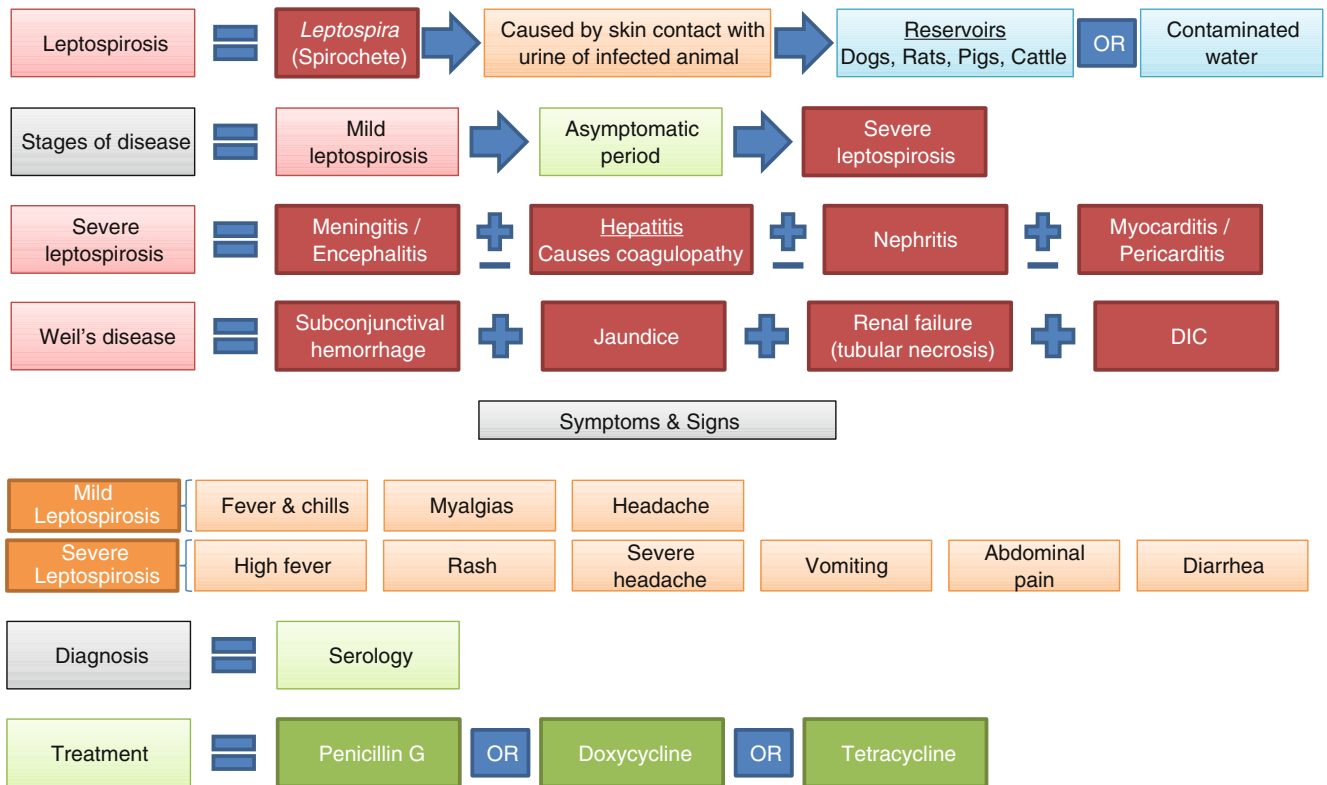


Lyme Disease

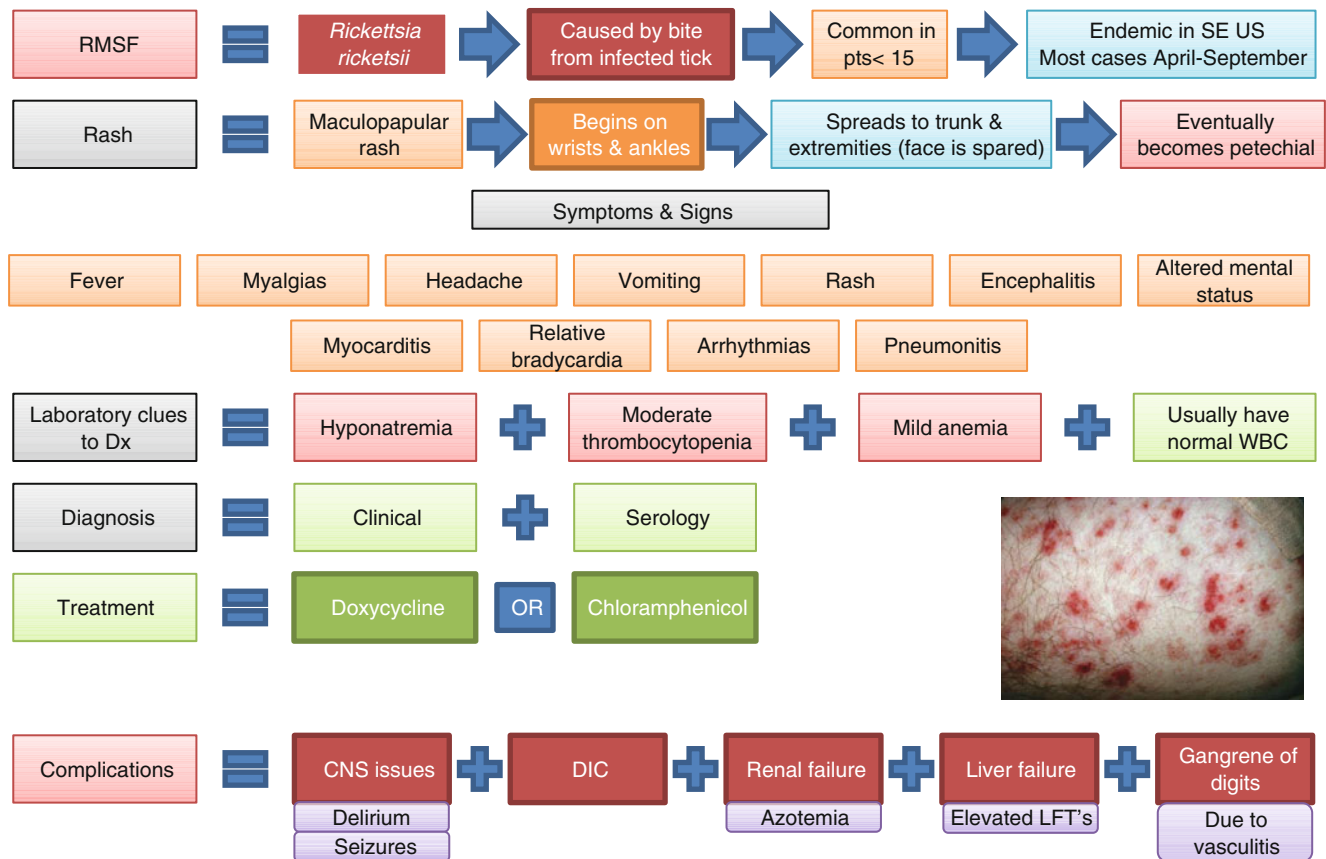


Right side image (Reprinted from Miró EM, Sánchez NP. Cutaneous manifestations of infectious diseases. In: Sánchez NP, editor. Atlas of dermatology in internal medicine. New York: Springer; 2012. p. 77–119. With permission from Springer Science + Business Media)

Leptospirosis



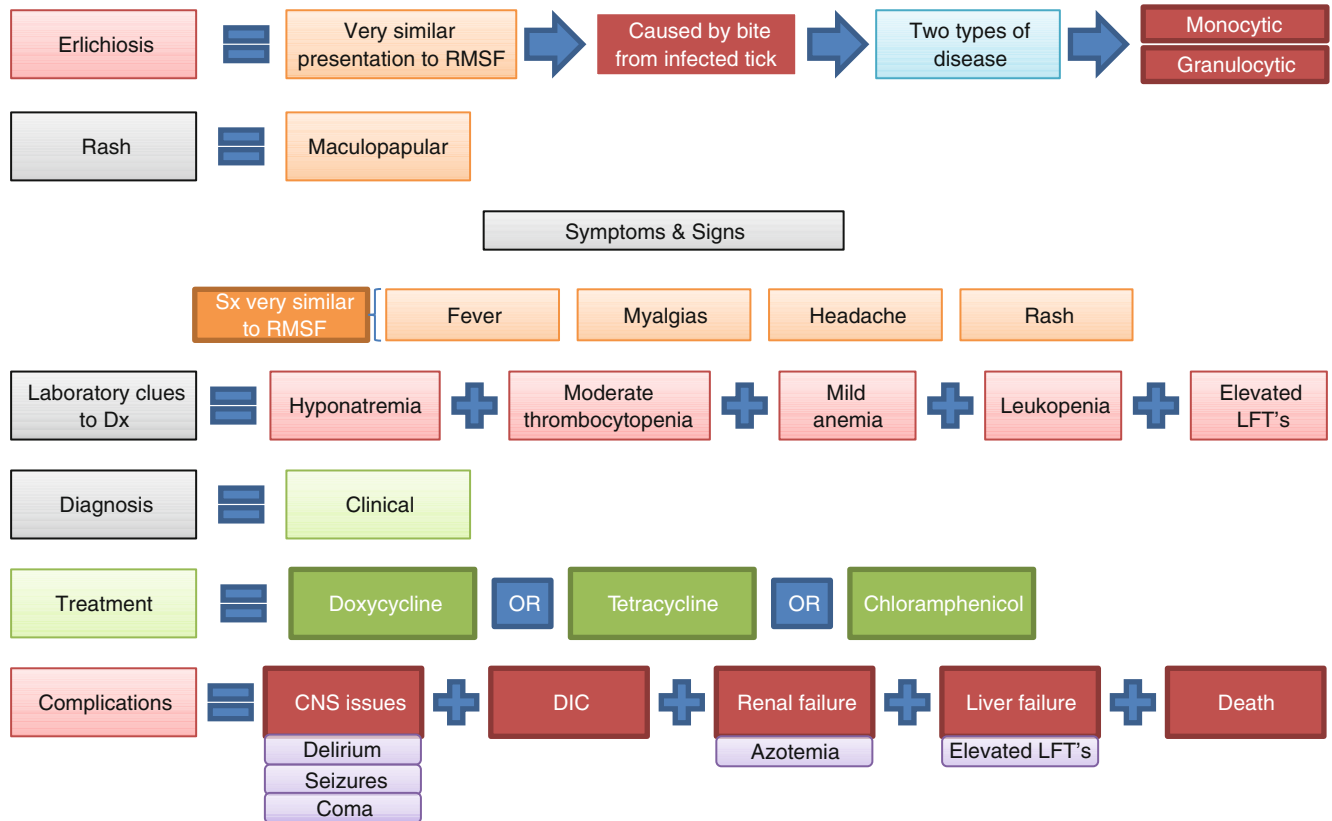
Rocky Mountain Spotted Fever (RMSF)



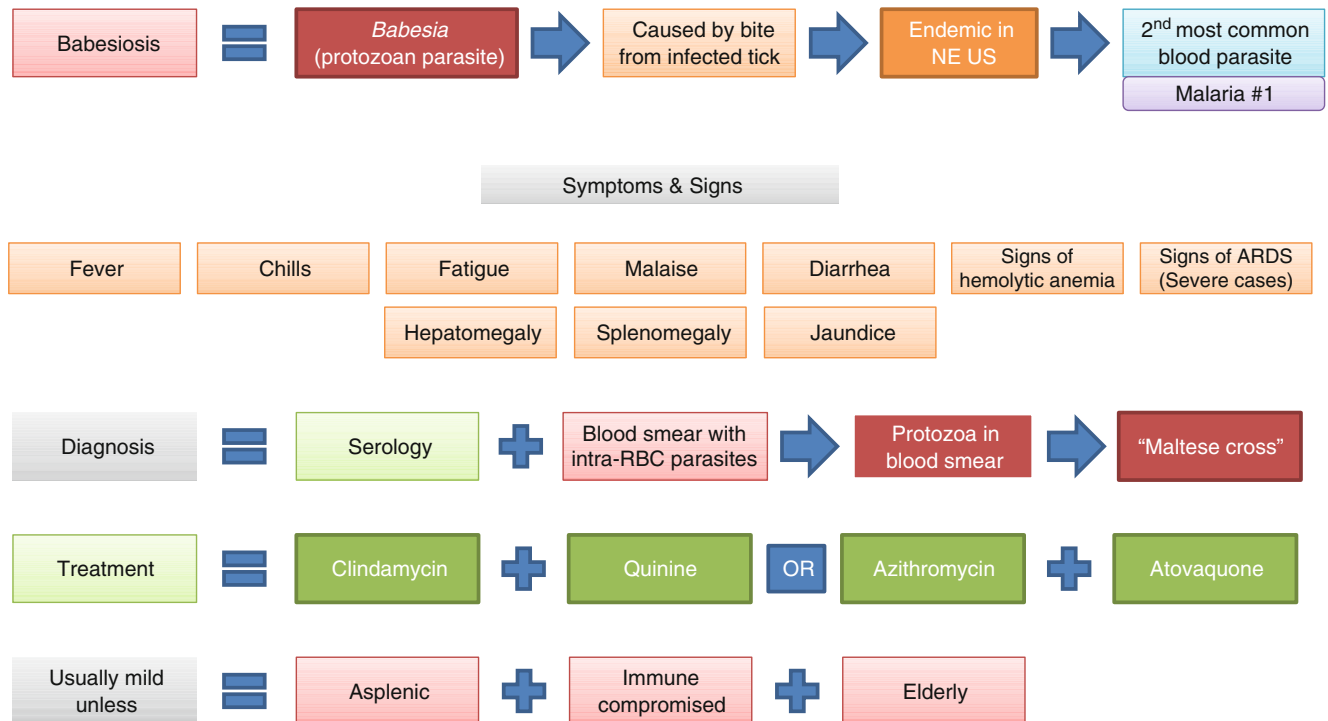
Bottom right image (Reprinted from Morgan MB, Smoller BR, Somach SC. Rocky mountain spotted fever and the rickettsioses. In: Morgan MB, Smoller BR, Somach SC, editors. Deadly dermatologic diseases:

clinicopathologic atlas and text. New York: Springer; 2007. p. 125–8. With permission from Springer Science + Business Media)

Ehrlichiosis



Babesiosis



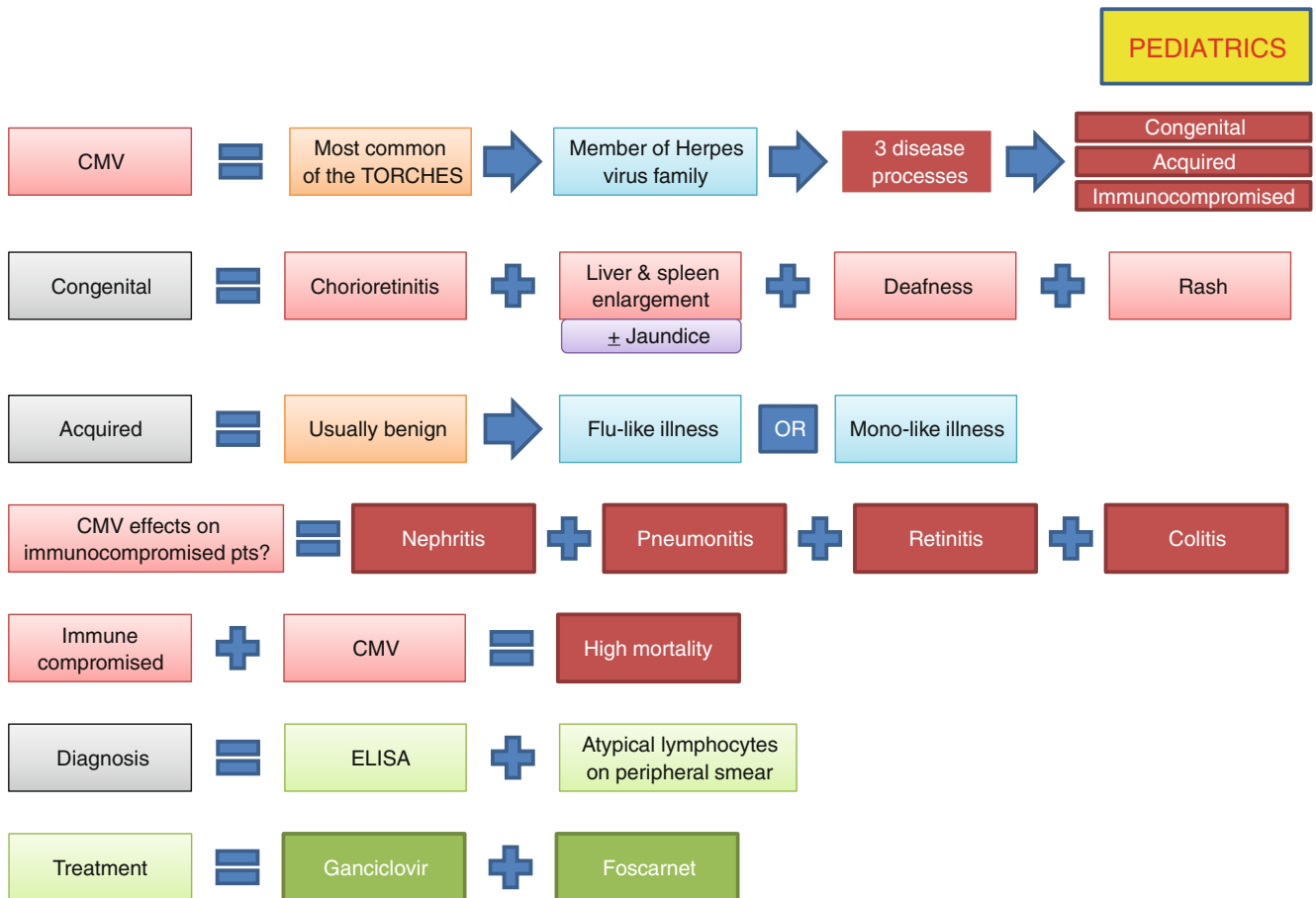
Viral Infections

TORCHES

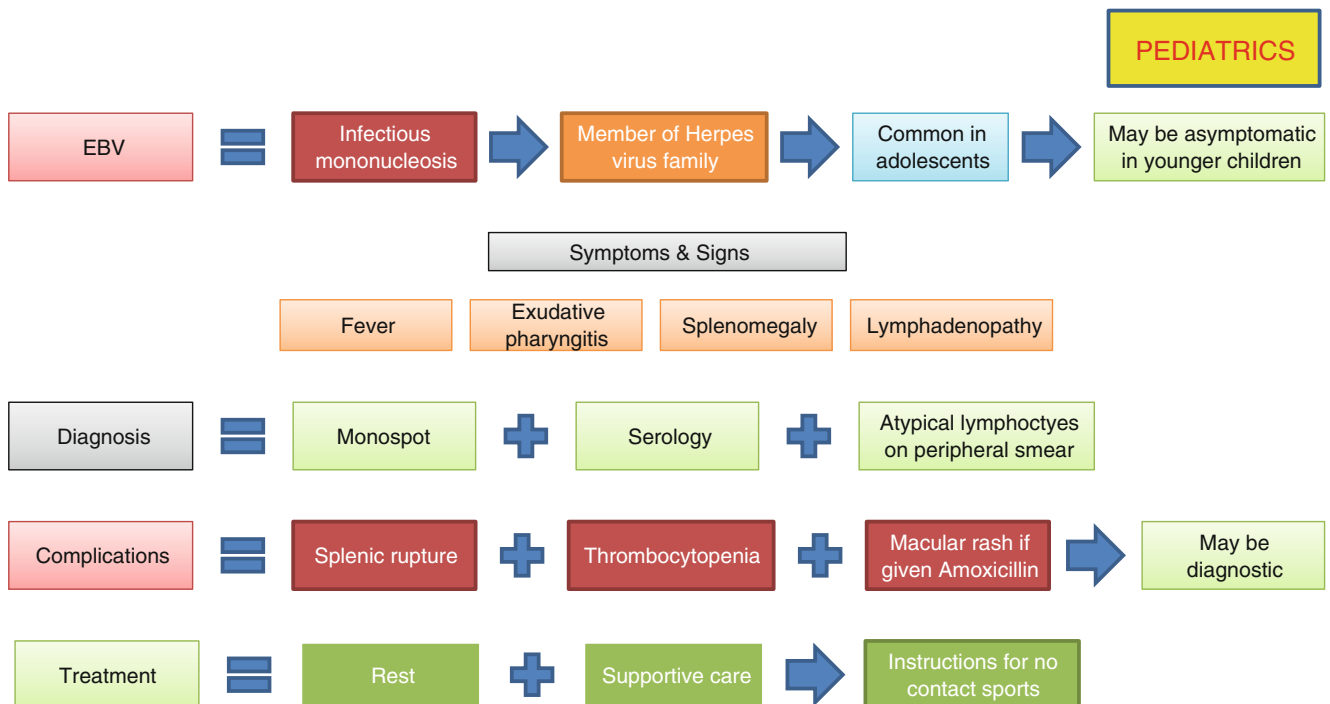
PEDIATRICS	
TO	Toxoplasmosis
R	Rubella
C	CMV
H	Herpes/HIV
E	Epstein-Barr Virus
S	Syphilis

These organisms are associated with congenital transmission

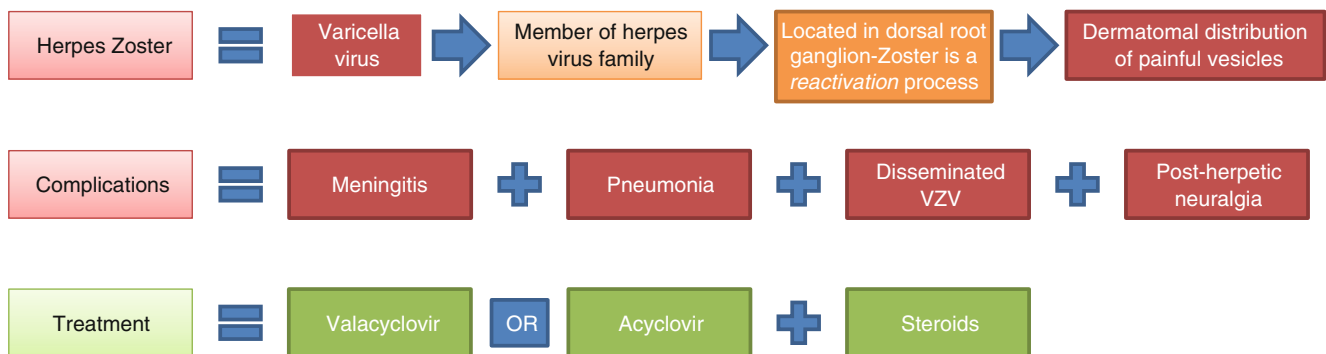
Cytomegalovirus (CMV)



Epstein-Barr Virus (EBV)

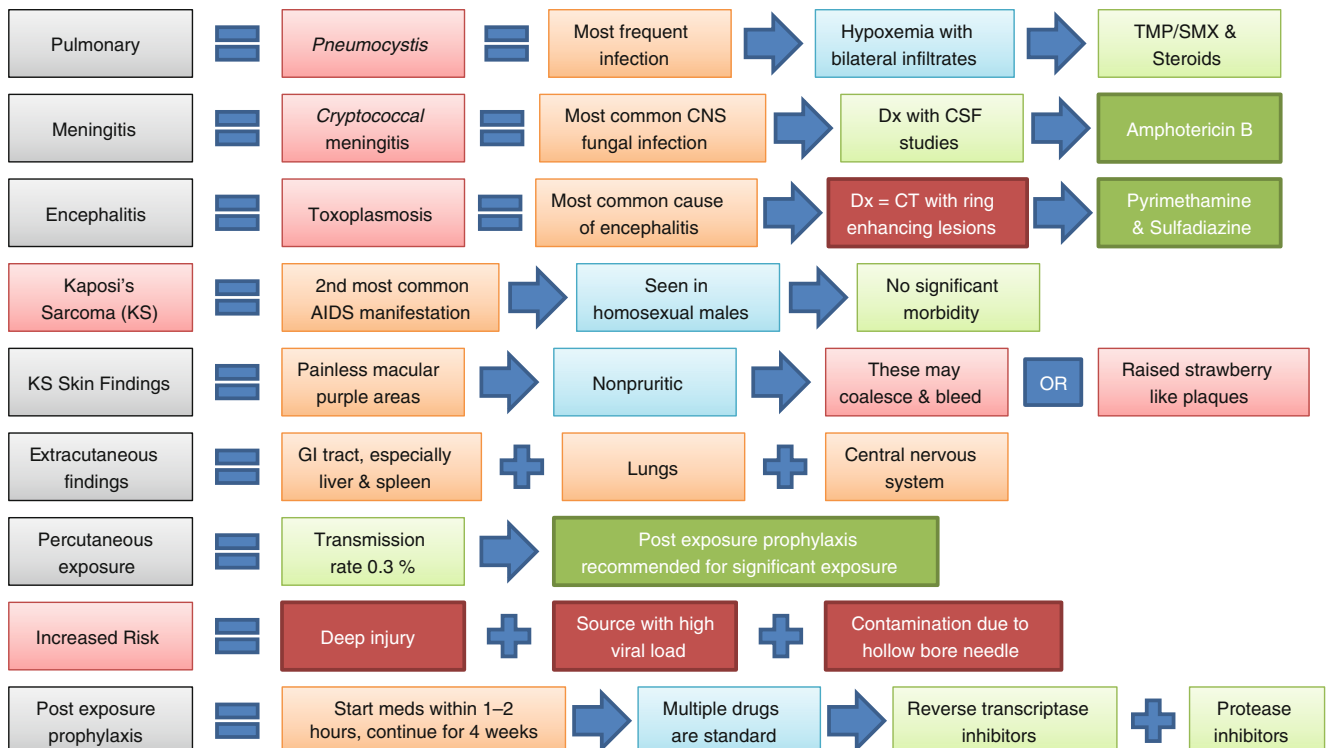


Herpes Zoster (HZV)

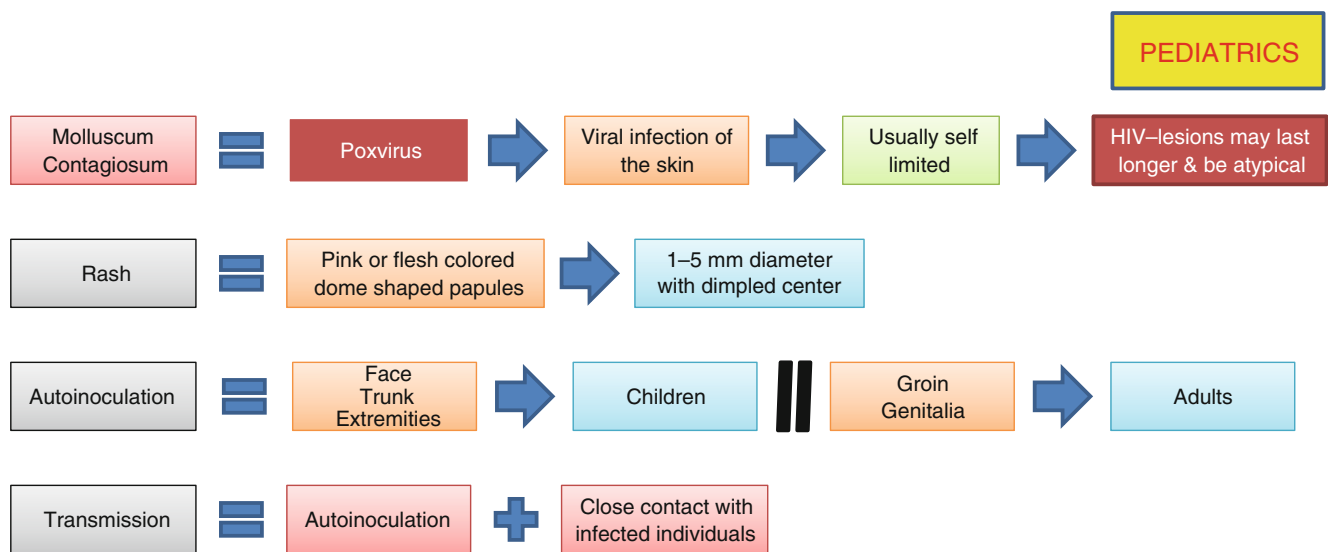


Bottom center image (Reprinted from Zaidi Z, Lanigan SW. Viral infections. In: Zaidi Z, Lanigan SW, editors. Dermatology in clinical practice. London: Springer; 2010. p. 101–23. With permission from Springer Verlag)

Complications of AIDS



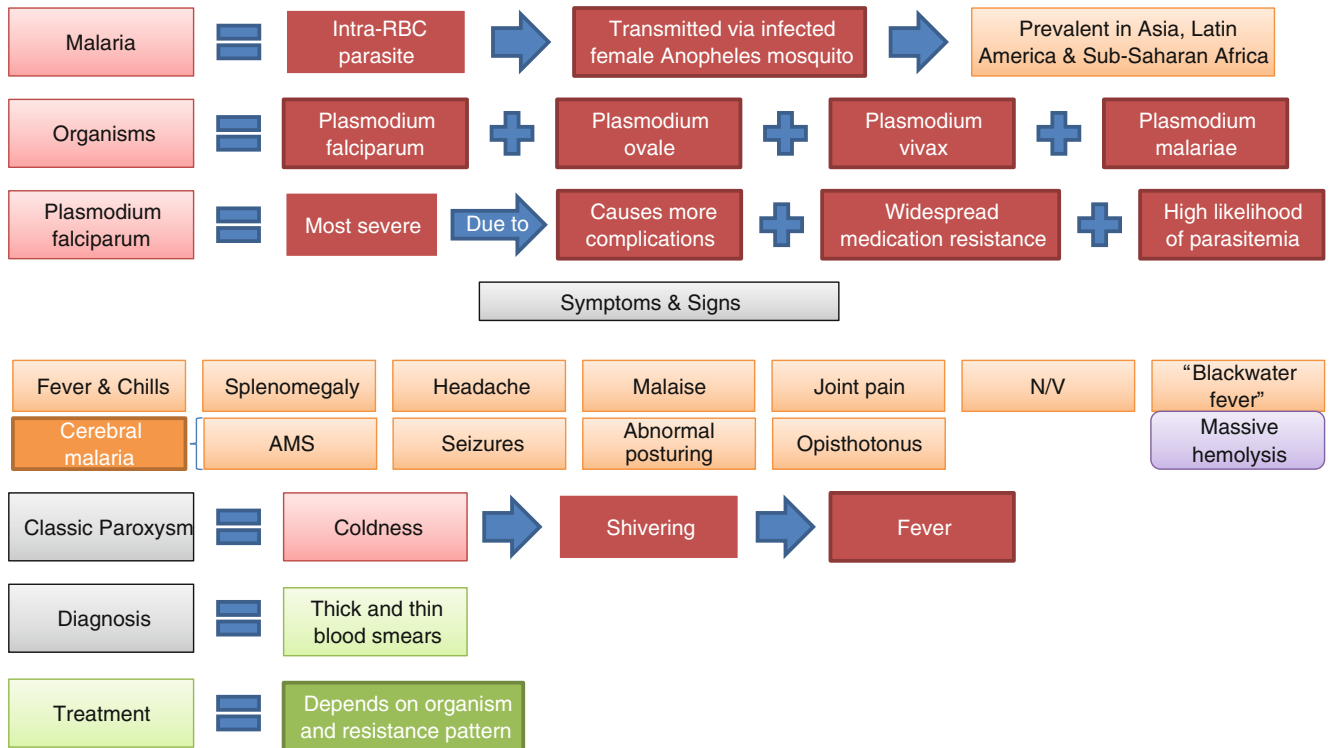
Molluscum Contagiosum



Bottom center image (Reprinted from Silverberg NB. Cutaneous infections. In: Silverberg NB, editor. Atlas of pediatric cutaneous biodiversity: comparative dermatologic atlas of pediatric skin of all colors.

New York: Springer; 2012. p. 113–25. With permission from Springer Science + Business Media)

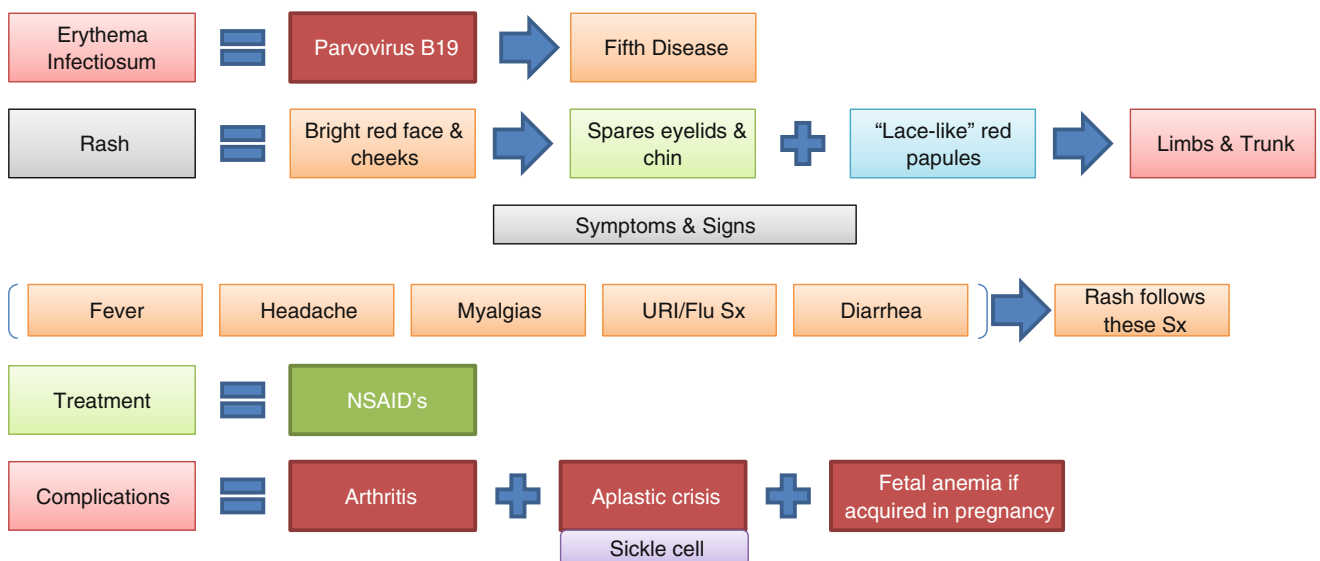
Malaria

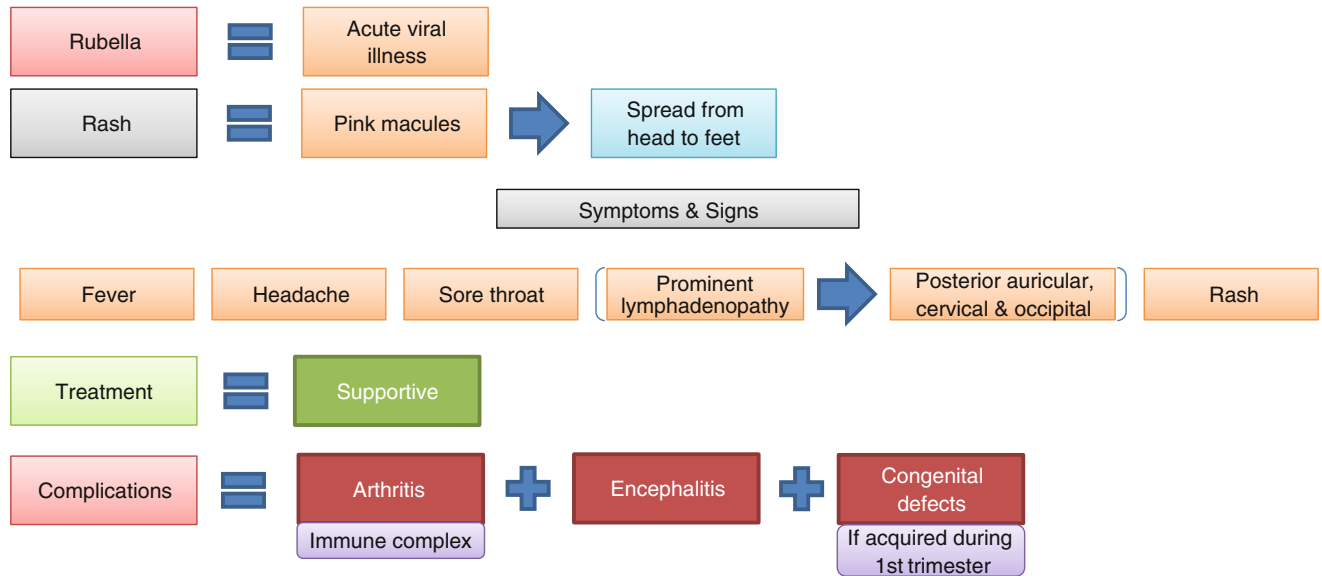


Pediatric Rashes

Erythema Infectiosum

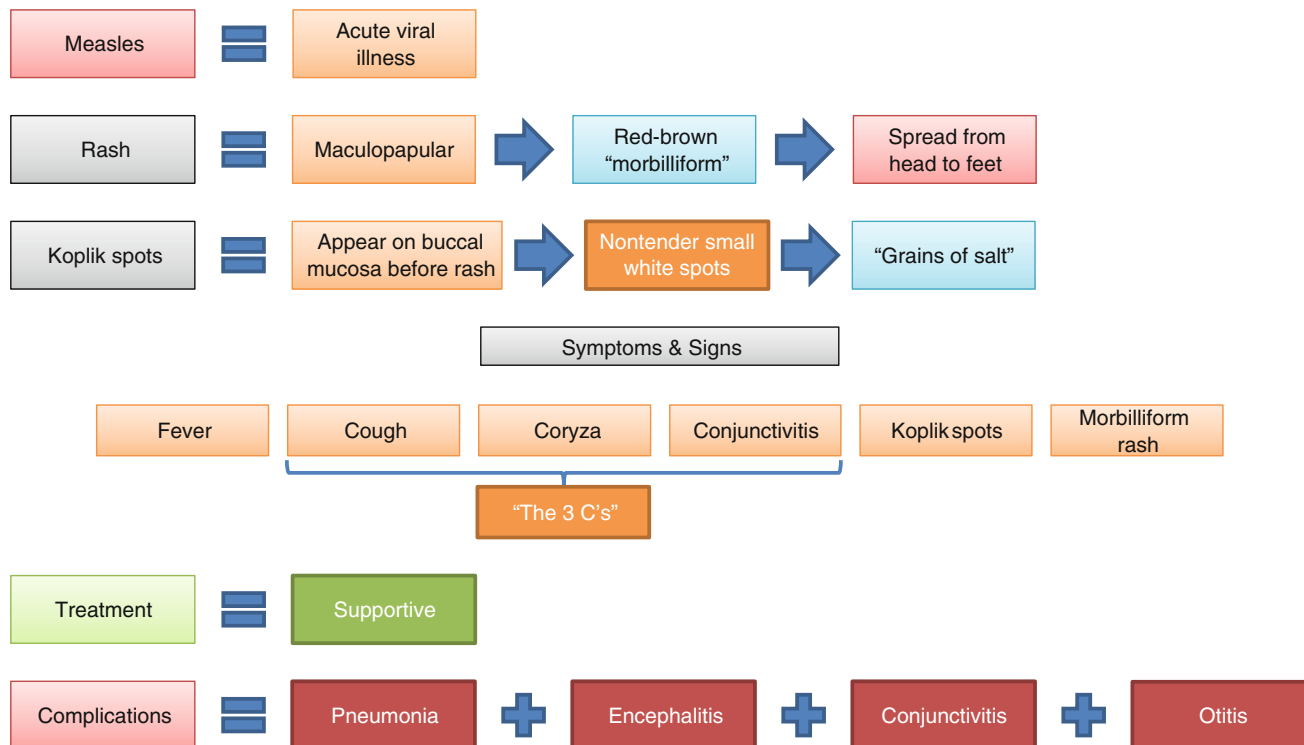
PEDIATRICS



Rubella**PEDIATRICS**

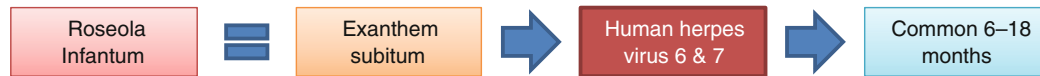
Measles (Rubeola)

PEDIATRICS



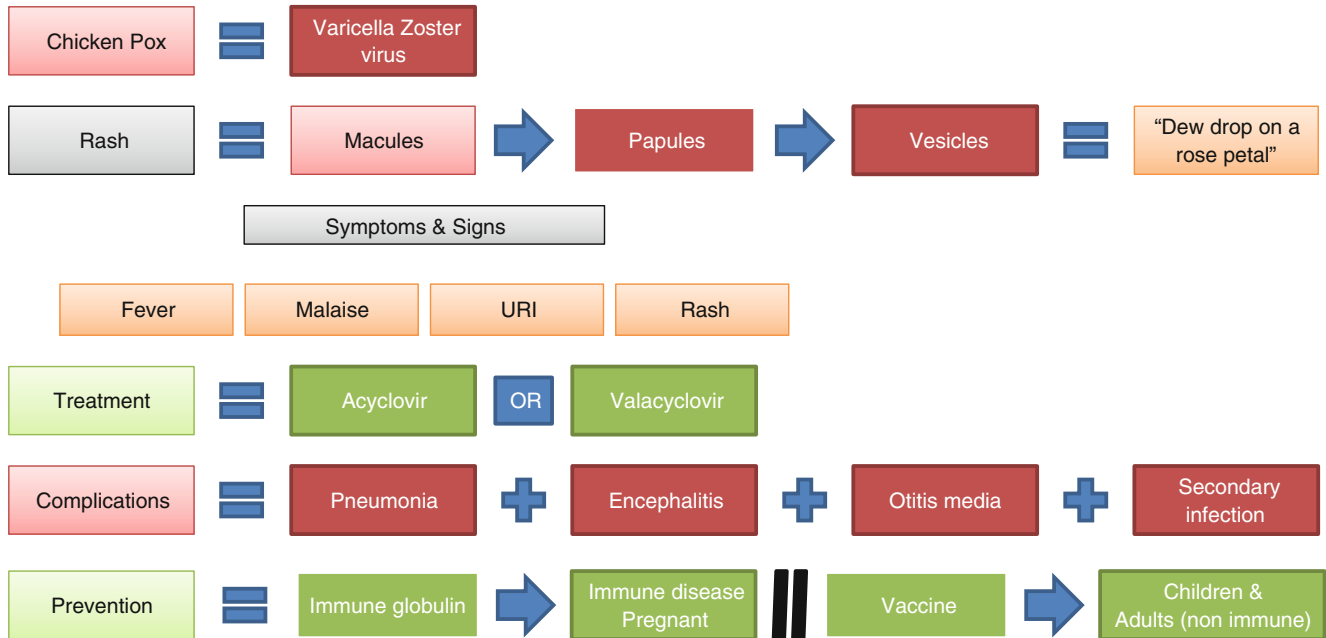
Roseola Infantum

PEDIATRICS



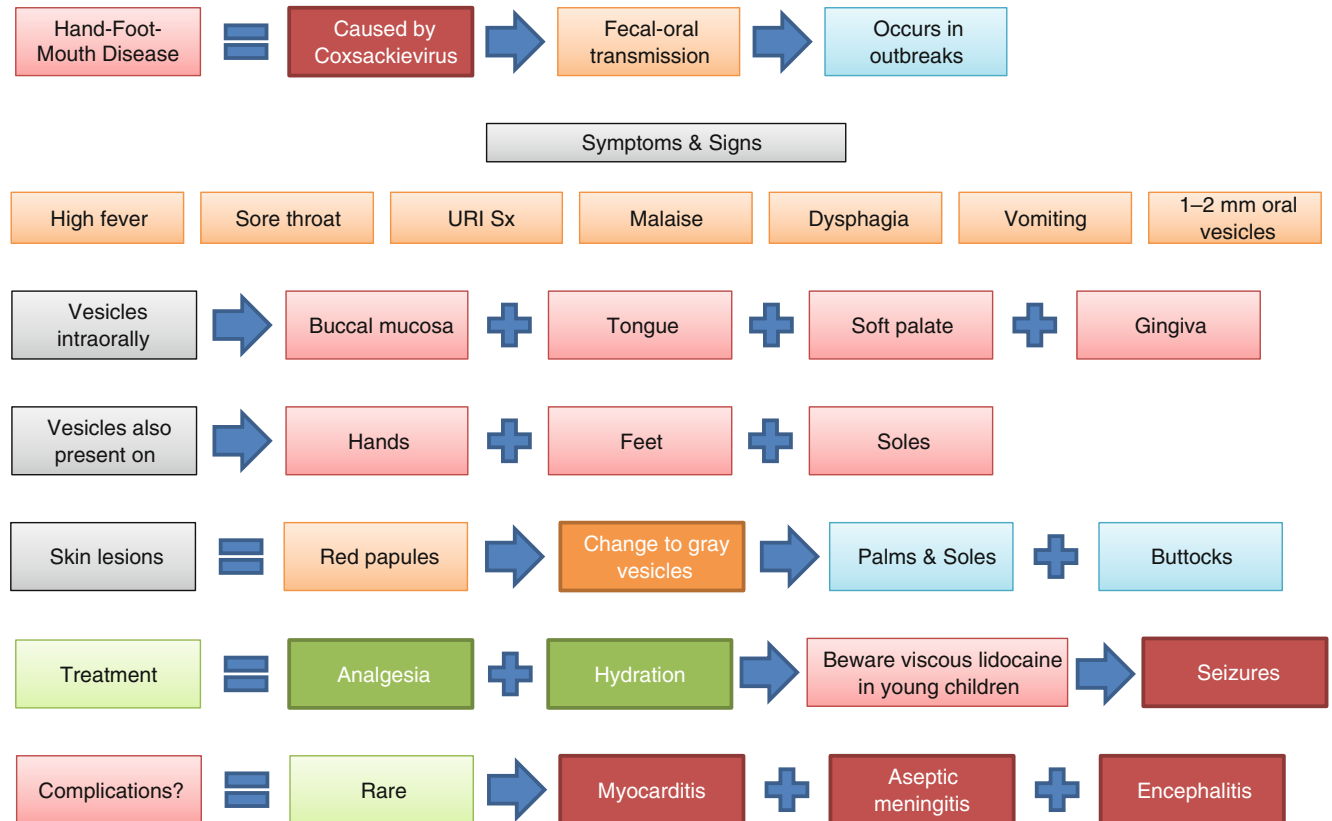
Symptoms & Signs



Varicella (Chicken Pox)**PEDIATRICS**

Avoid salicylates!
May precipitate Reye syndrome

Hand-Foot-Mouth Disease

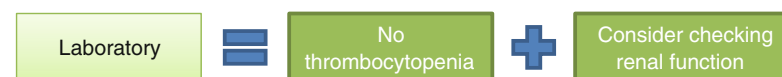
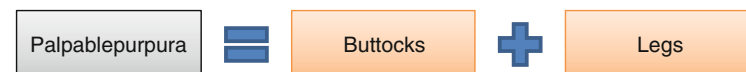
PEDIATRICS

Henoch-Schonlein Purpura (HSP)

PEDIATRICS



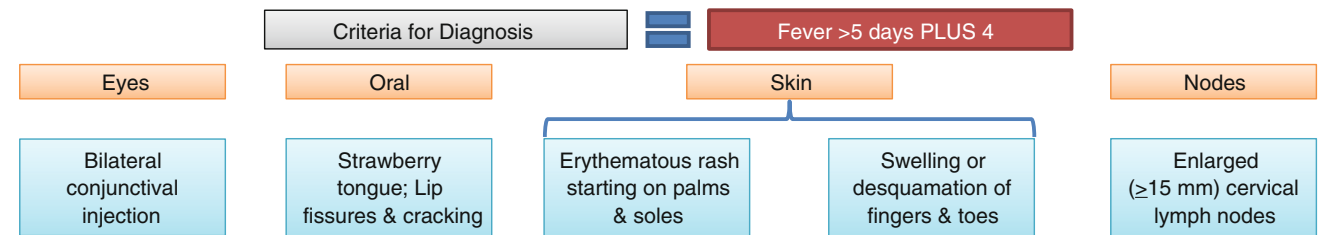
Symptoms & Signs



Right side image (Reprinted from Zaidi Z, Lanigan SW. Vasculitis, common erythemas, and lymphatic disorders. In: Zaidi Z, Lanigan SW, editors. Dermatology in clinical practice. London: Springer; 2010. p. 253–70. With permission from Springer Verlag)

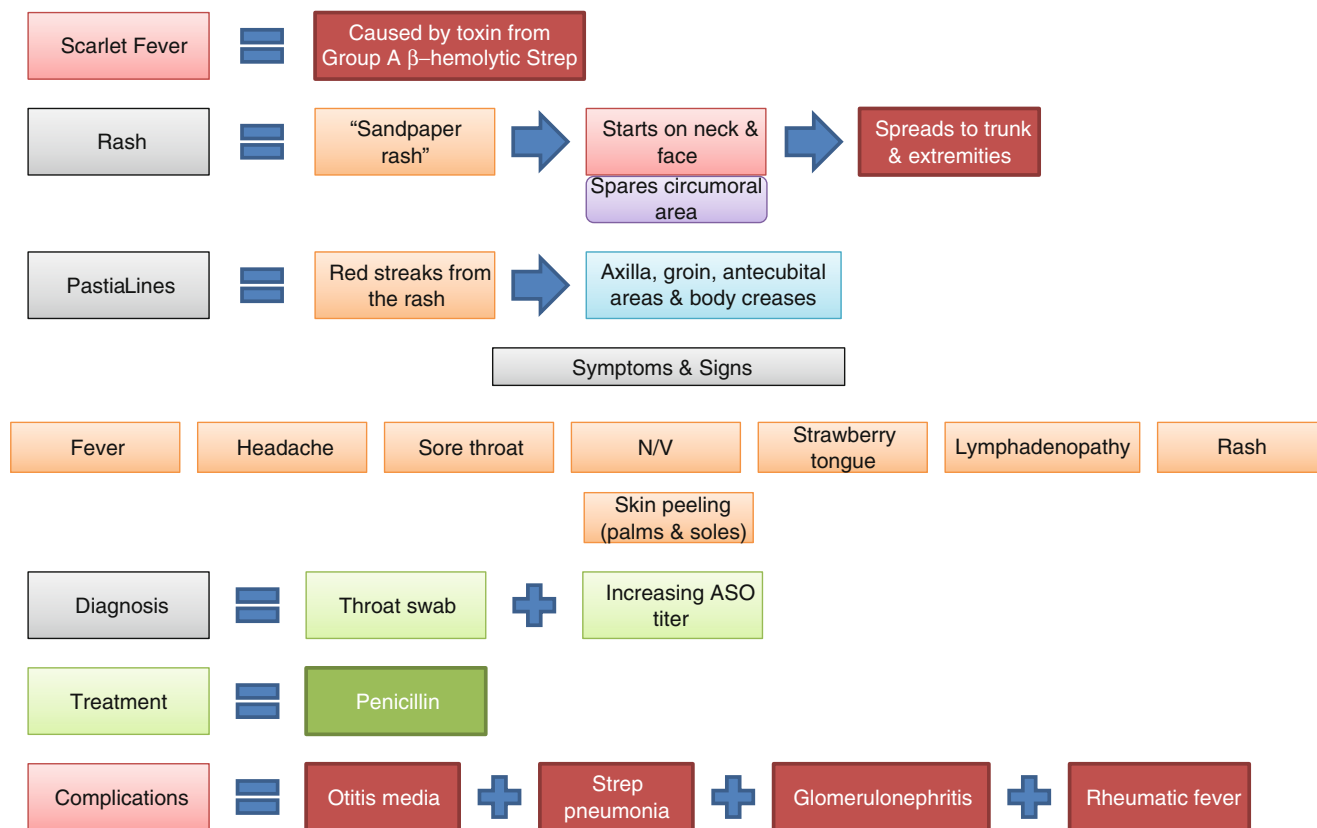
Kawasaki's Disease

PEDIATRICS



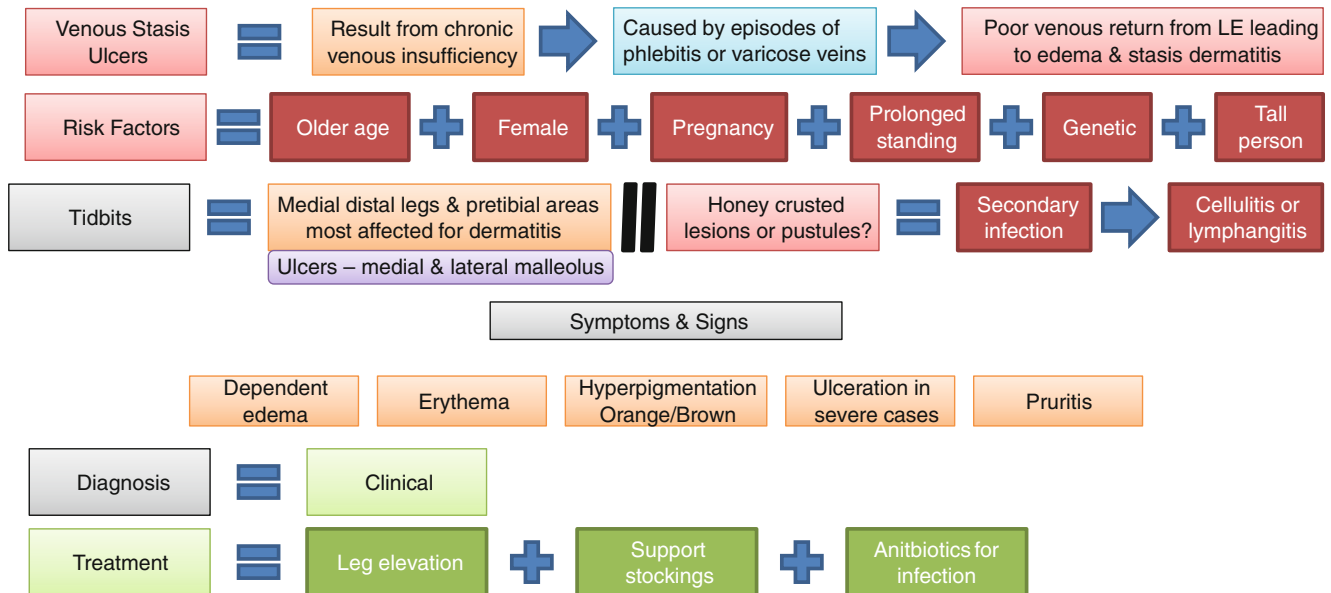
Scarlet Fever

PEDIATRICS

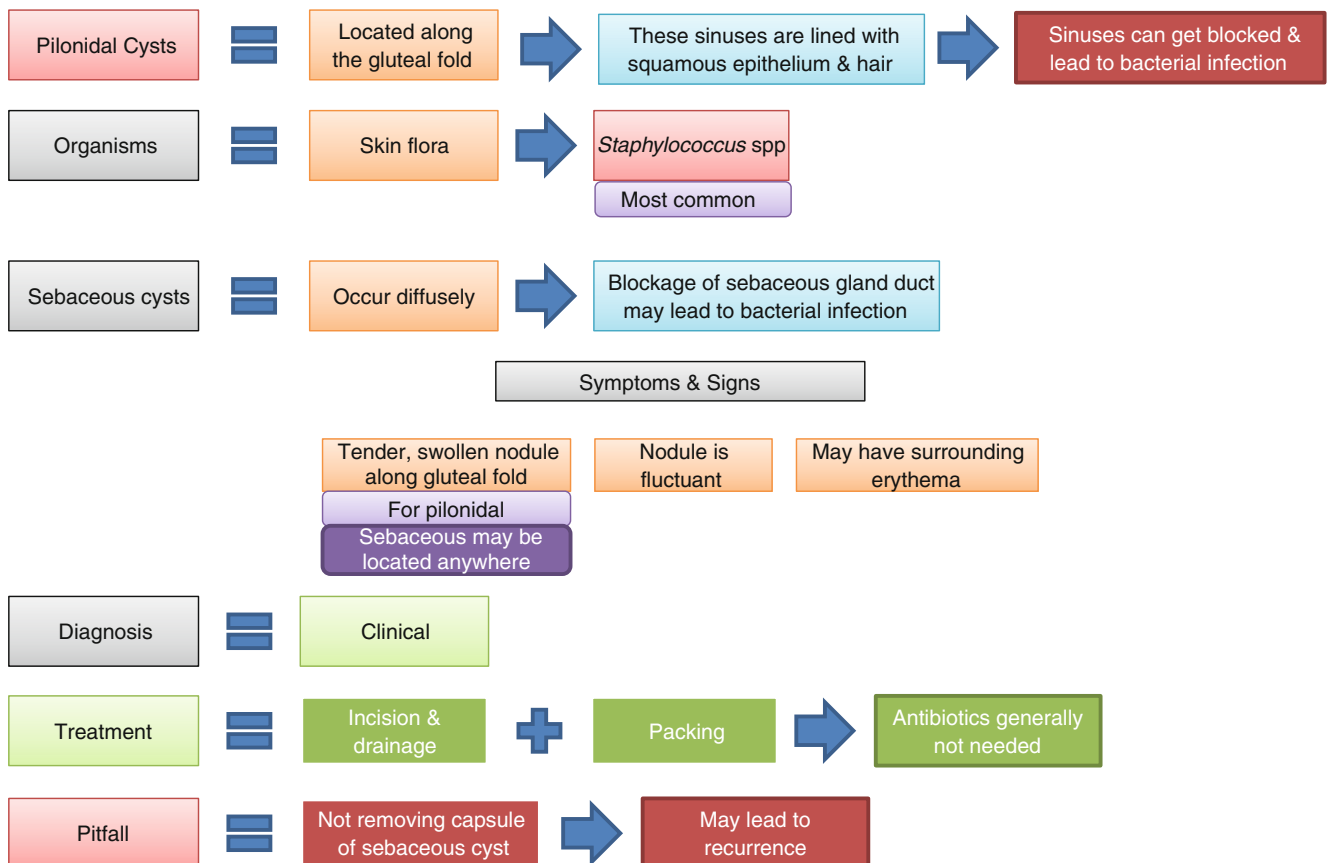


Miscellaneous Skin-Related Disorders

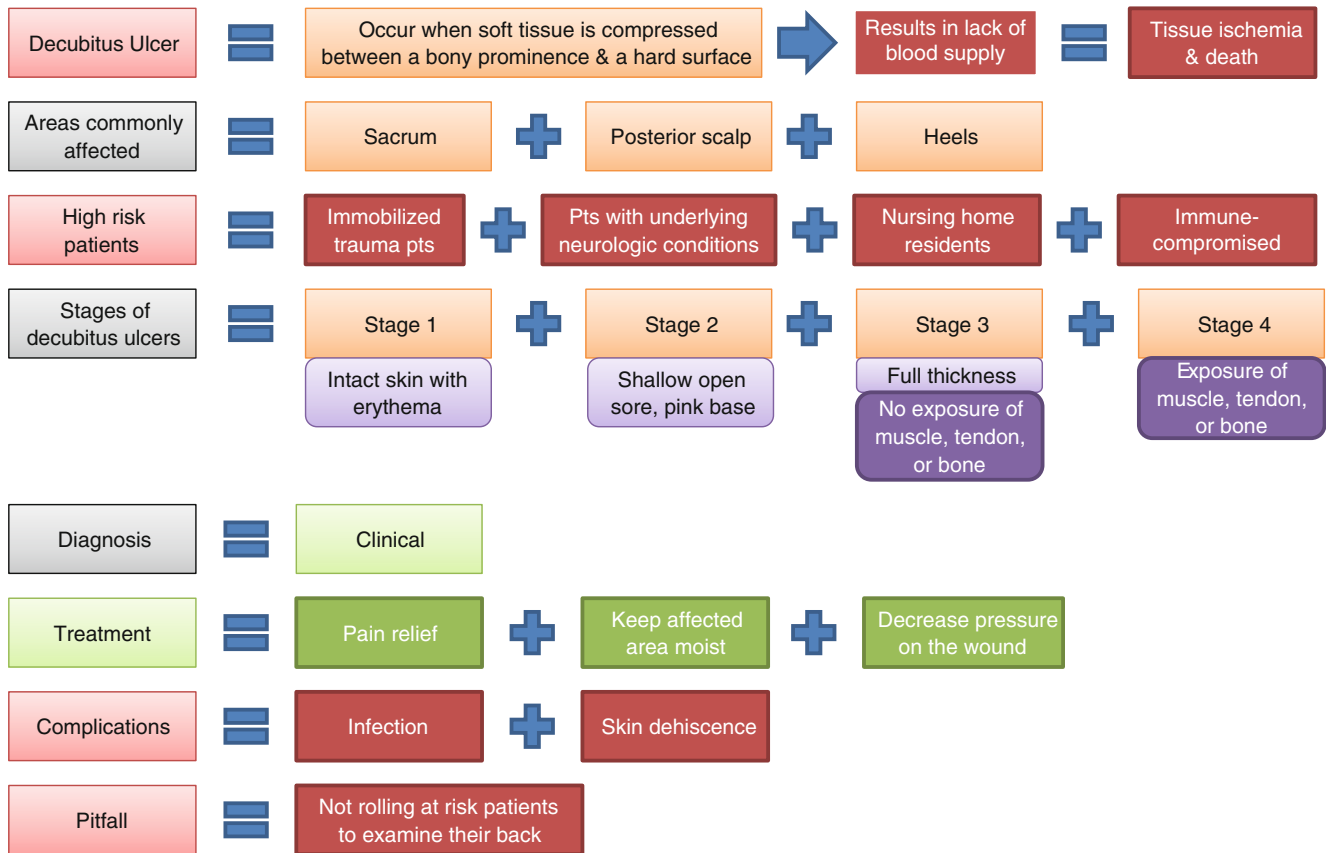
Venous Stasis Ulcers



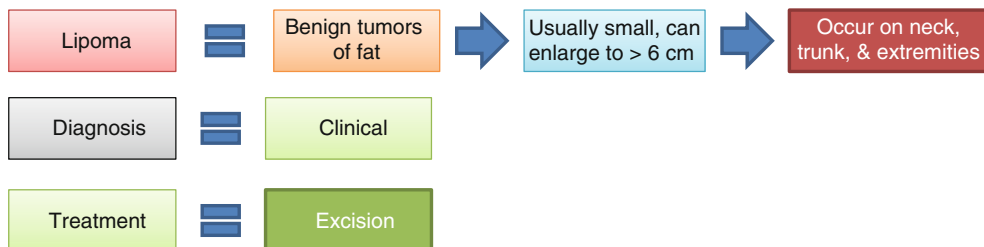
Pilonidal and Sebaceous Cysts and Abscess



Decubitus Ulcers

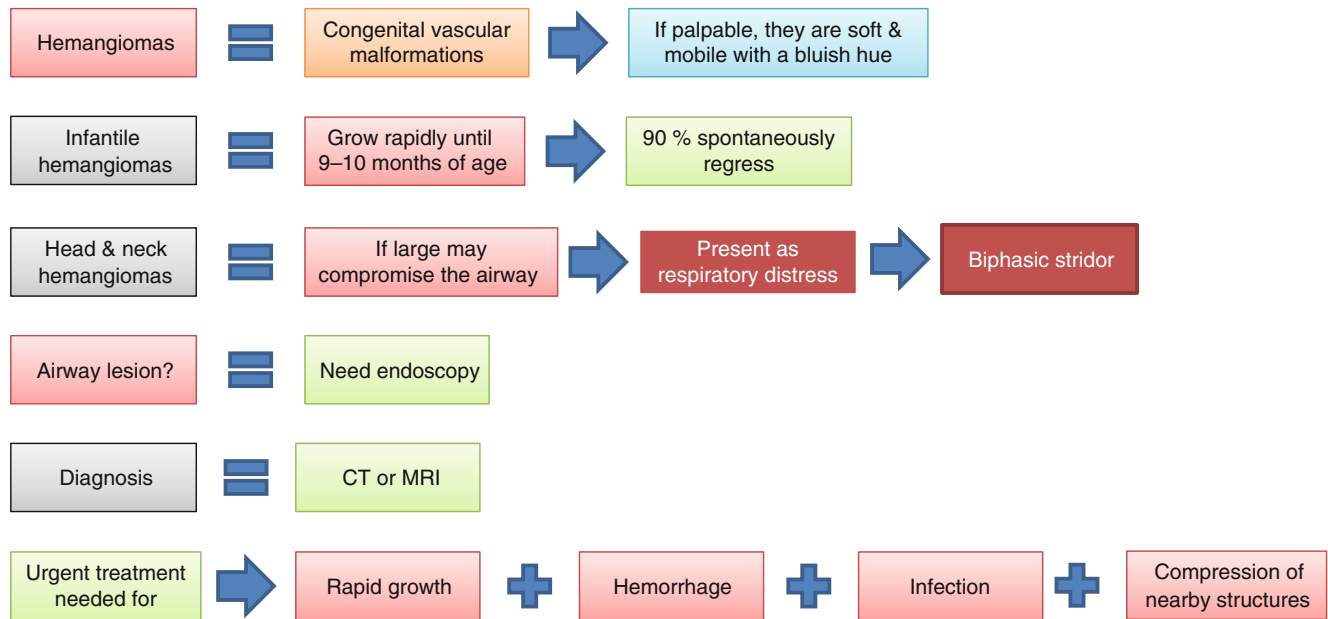


Lipoma



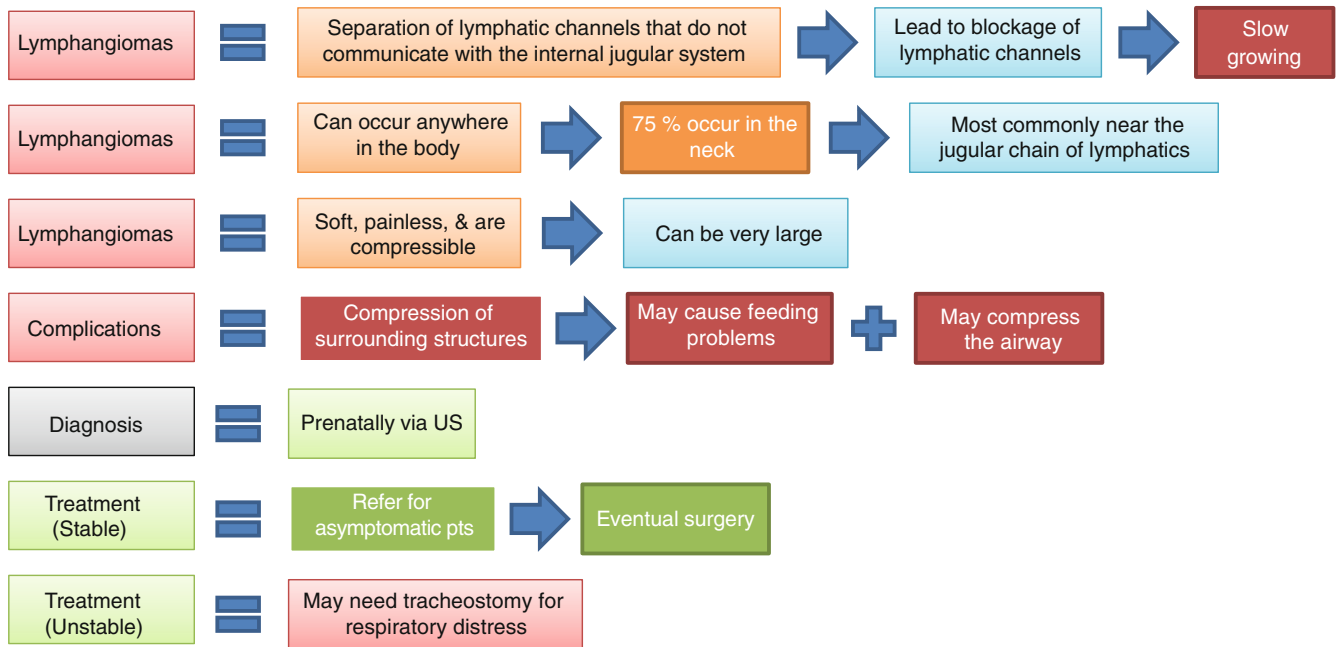
Hemangiomas

PEDIATRICS



Lymphangiomas (Cystic Hygroma)

PEDIATRICS



Endocrine/Metabolic/Electrolytes

Bobby Desai

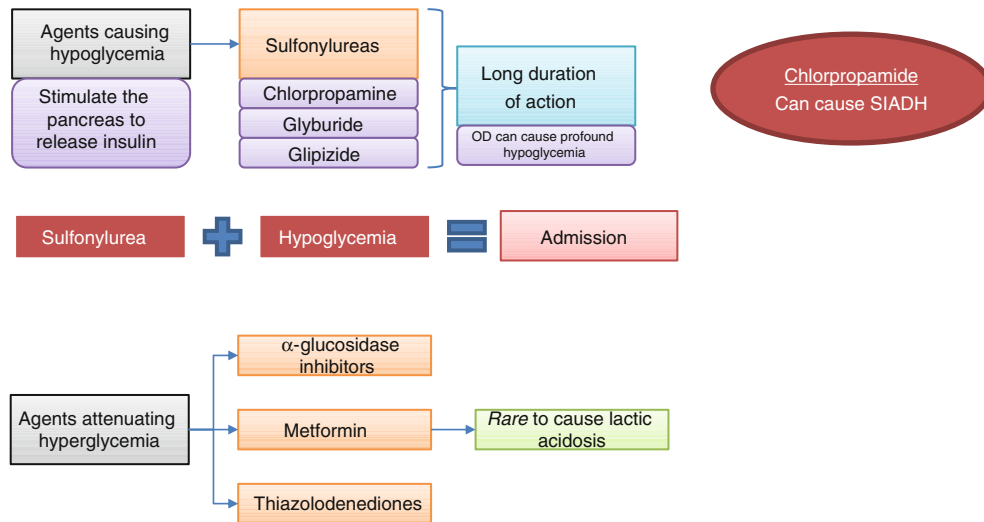
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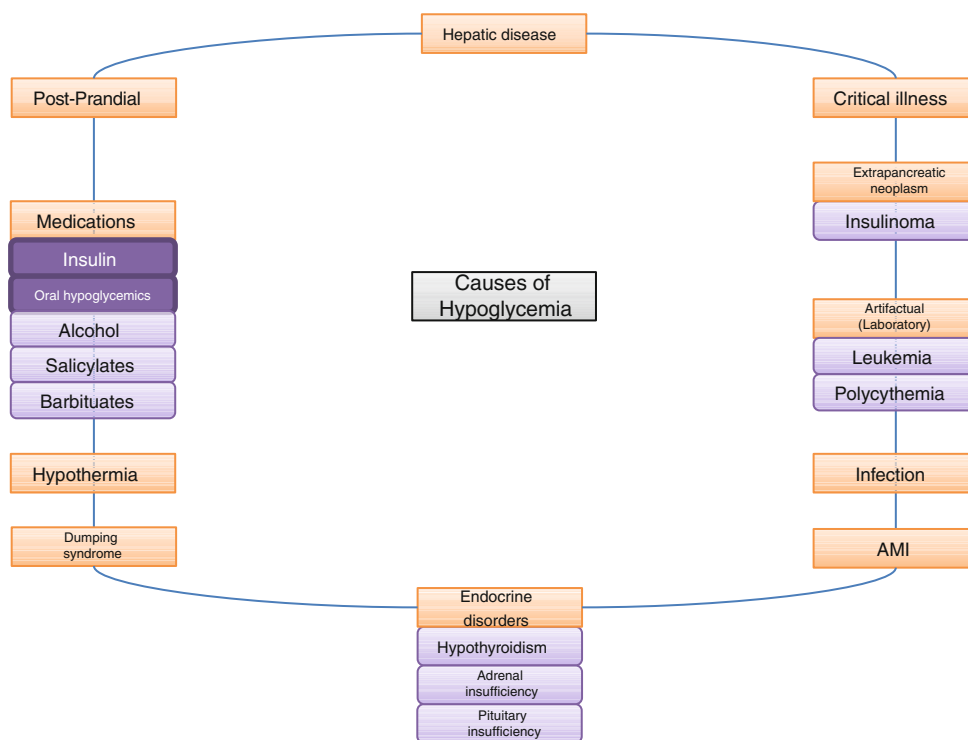
B. Desai, MD, MEd
Department of Emergency Medicine, University of Florida,
Gainesville, FL, USA
e-mail: bdesai@ufl.edu

Hypoglycemia

Agents for Glucose Control



Hypoglycemia



Hypoglycemia: Clinical Features

Depend on glucose level
and rate of glucose drop

Sympathomimetic Symptoms

Can be masked by β -blockers

Tremor

Diaphoresis

Pallor

Nausea

Anxiety

Palpitations

Shivering

Neuroglycopenic Symptoms

Confusion

Psychosis

Drowsiness

Dizziness

Tiredness

Can have severe
obundation

Coma

Concentration
difficulty

Tidbits of Hypoglycemia

Glucose

Primary energy
source for brain

Glucose
control

Role of multiple
counterregulatory
hormones

Glucagon

Norepinephrine

Growth Hormone

Epinephrine

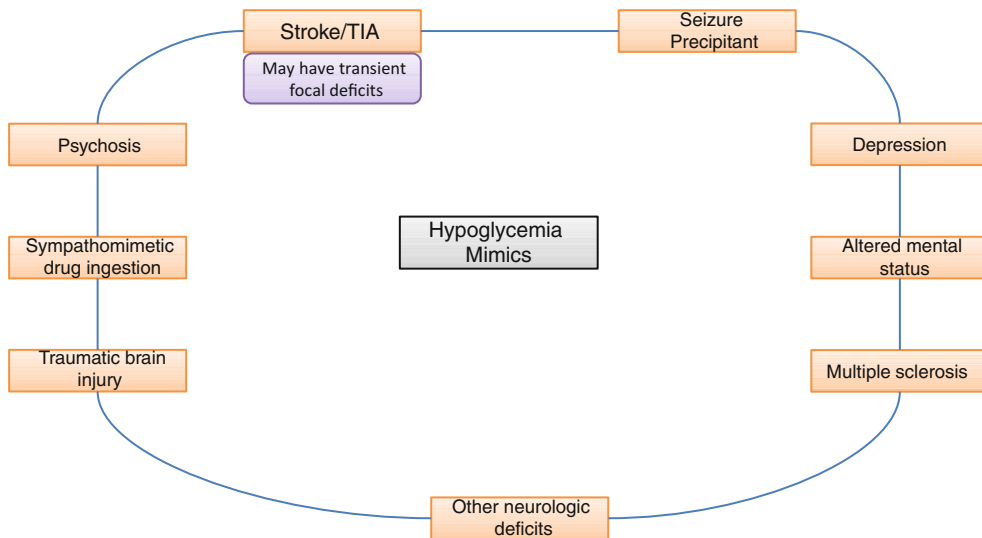
Glucocorticoids

Cause the
release of liver
glycogen stores

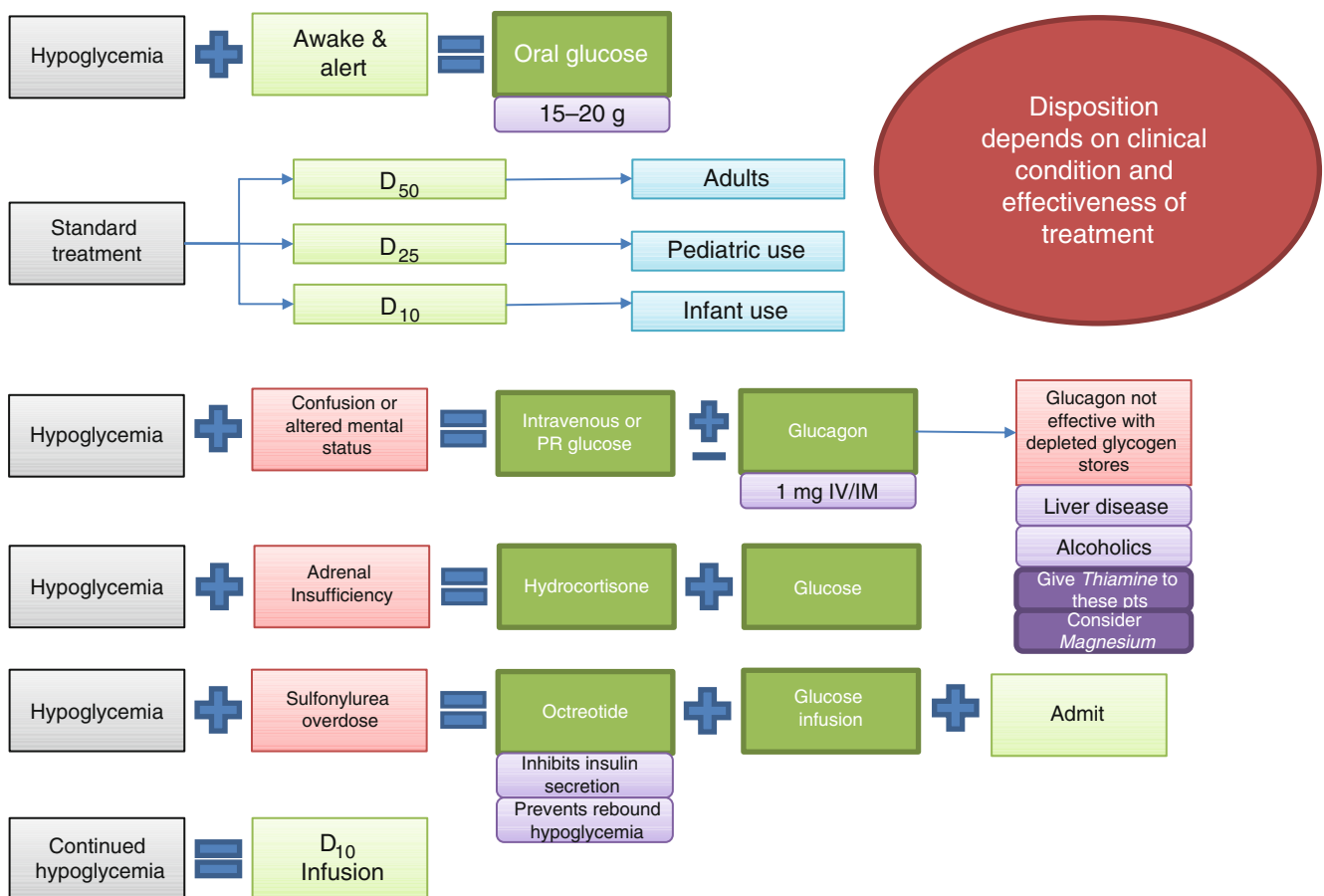
Excess exogenous
insulin

NO measurable C-
peptide level

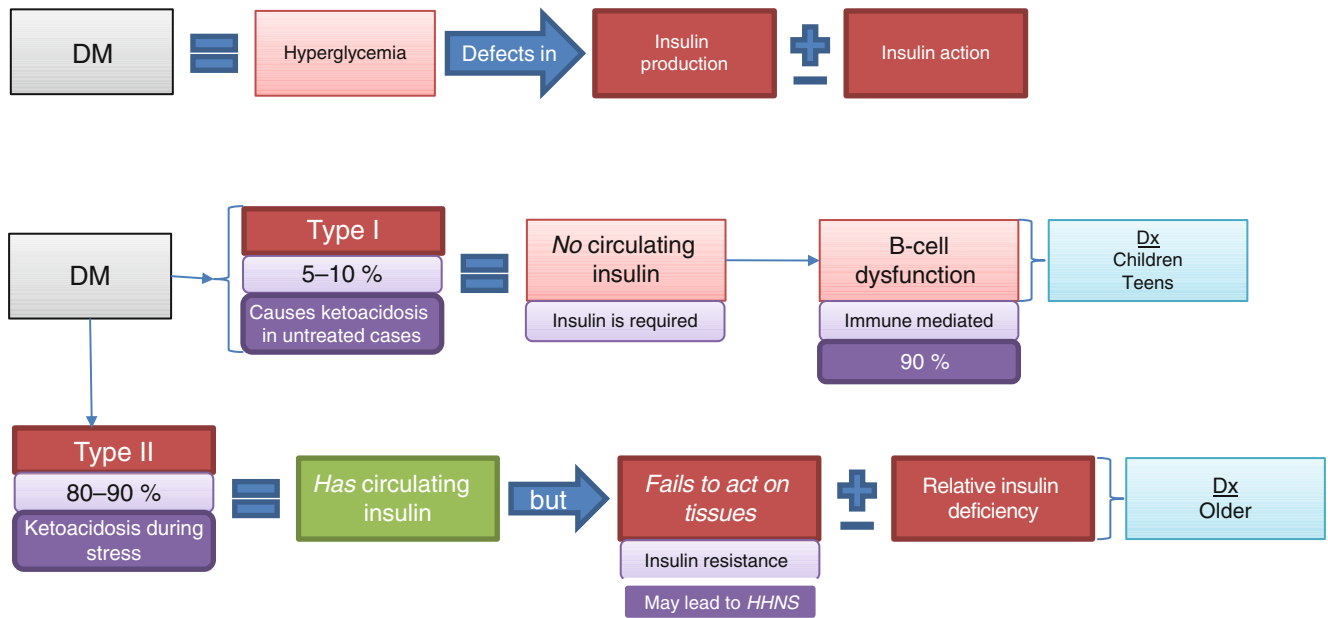
Hypoglycemia Differential Diagnosis



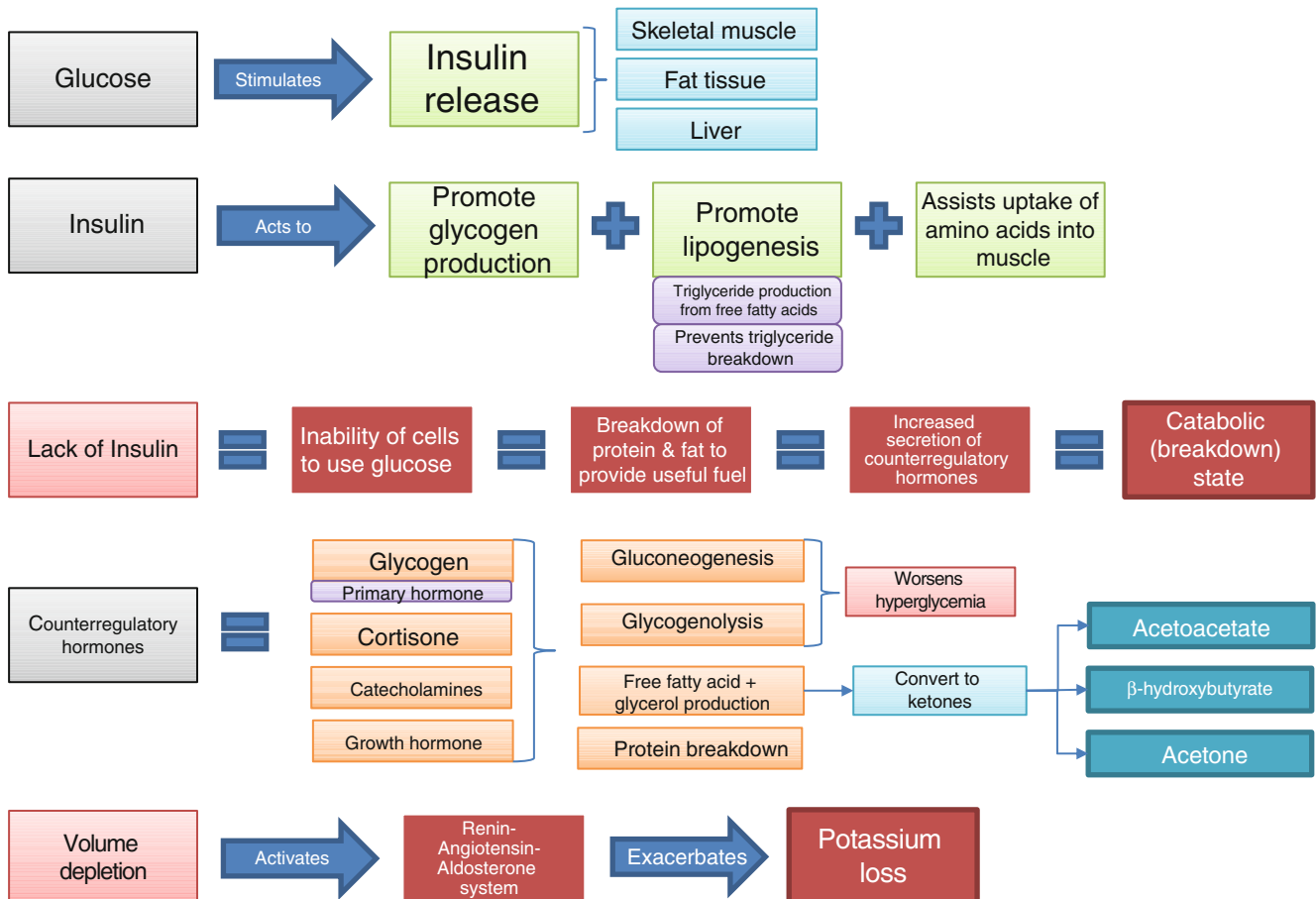
Treatment of Hypoglycemia



Diabetes Mellitus



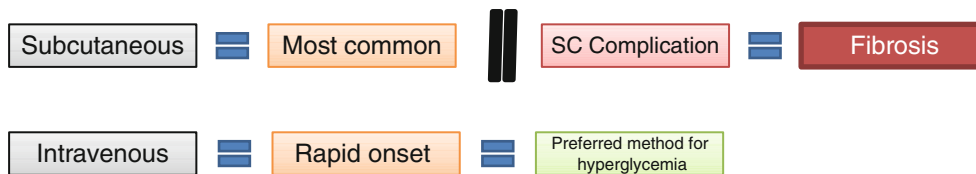
Tidbits About Hormones



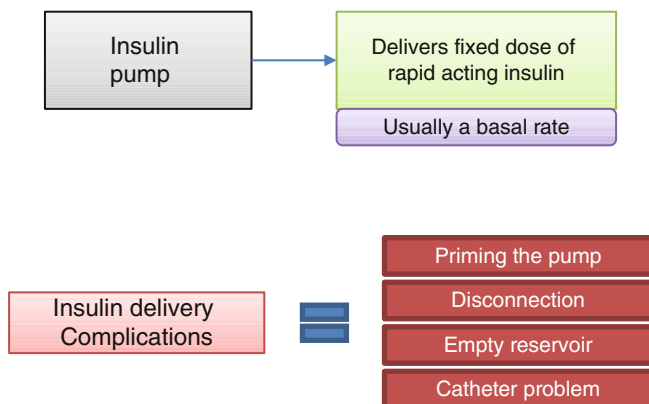
Types of Insulin

	Rapid	Short	Intermediate	Long
Time of Onset	6 – 15 min	15 – 60 min	1–4 hrs	90 min
Time to Peak	1–2 hrs	2–4 hrs	6–9 hrs	No peak
Duration of effect	3–6 hrs	6–8 hrs	6–24 hrs	24 hrs

Insulin Administration

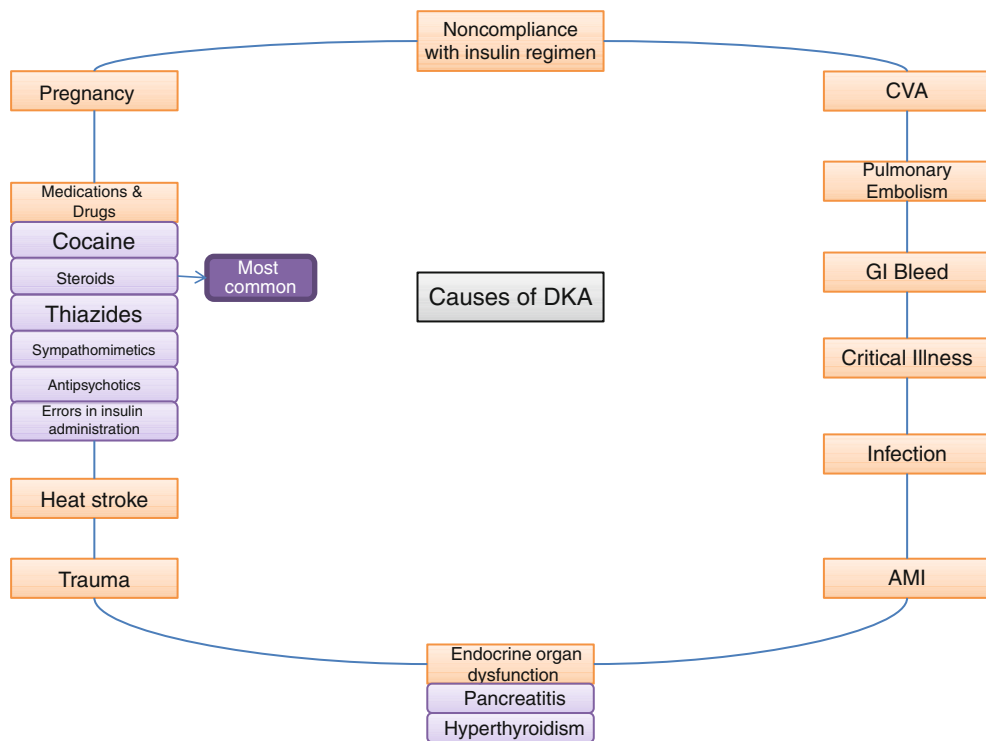


Insulin Pump

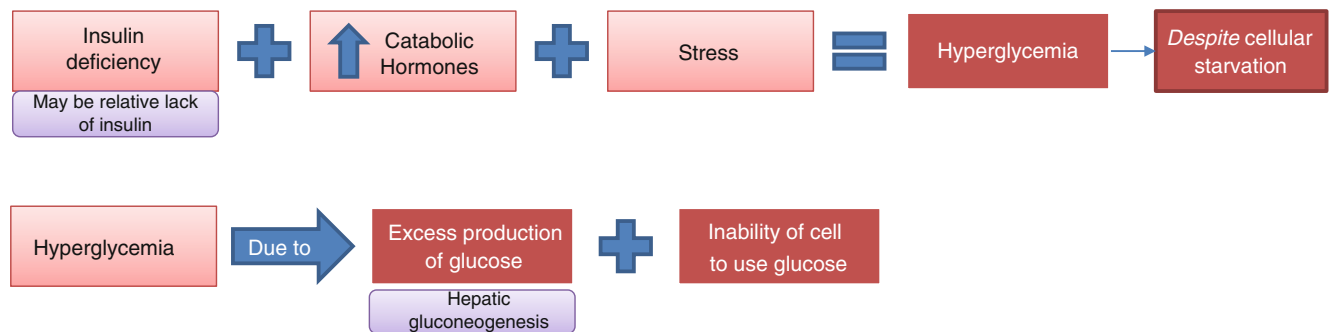


Diabetic Ketoacidosis

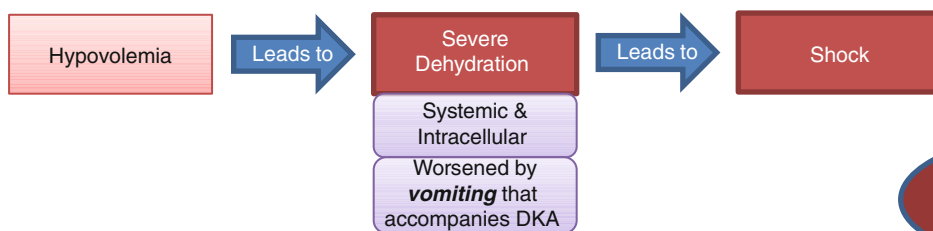
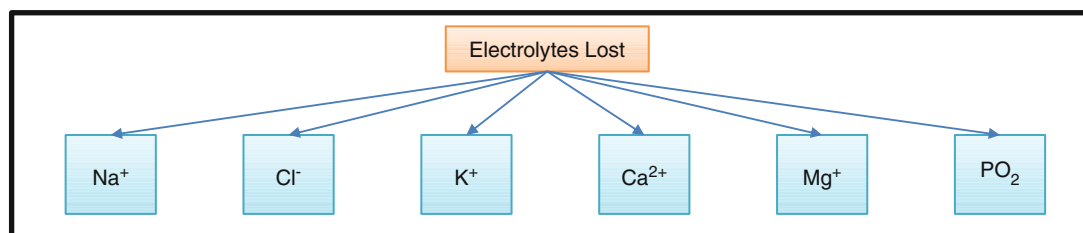
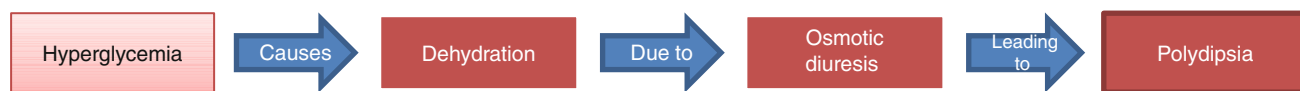
Some Causes of Diabetic Ketoacidosis



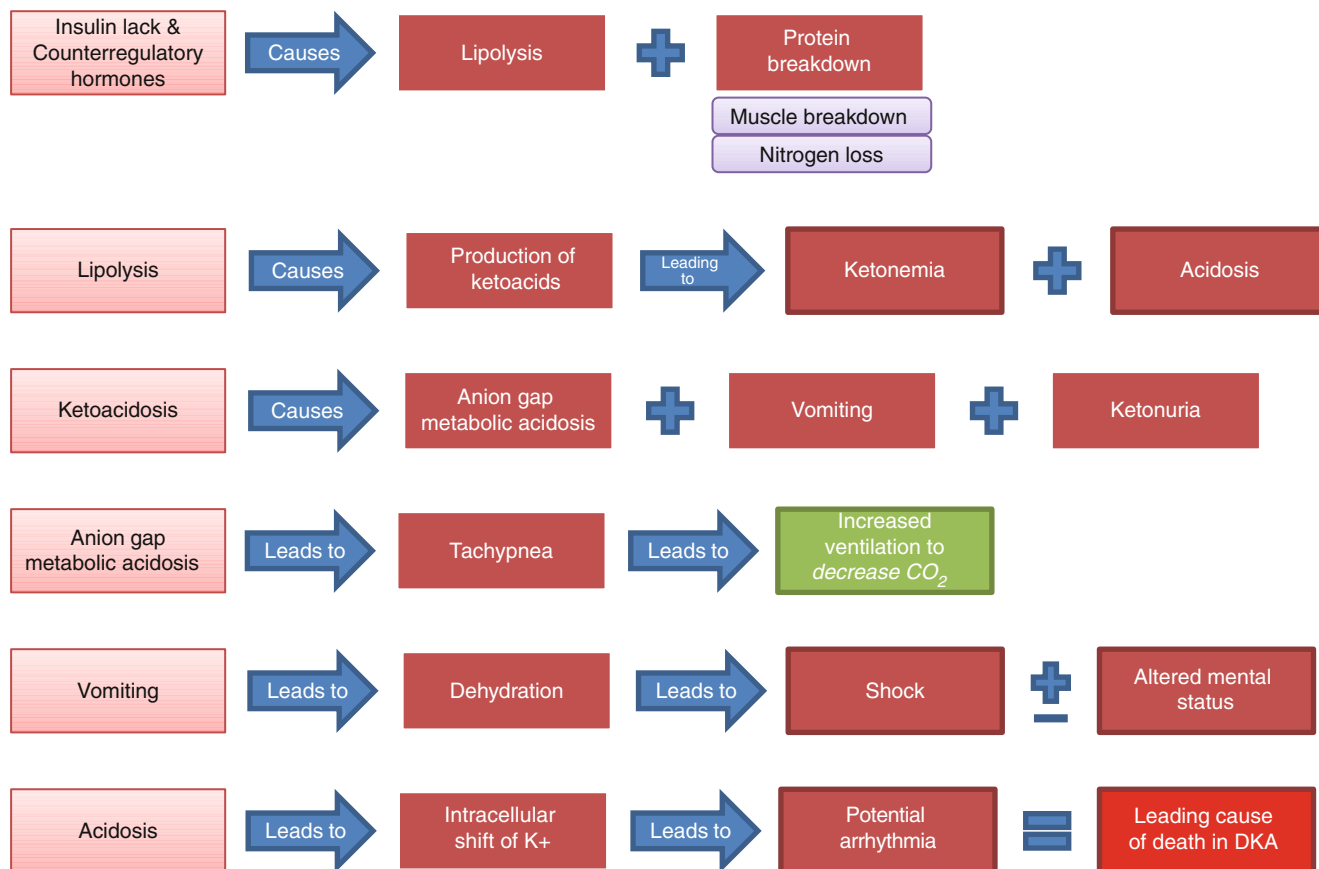
Diabetic Ketoacidosis



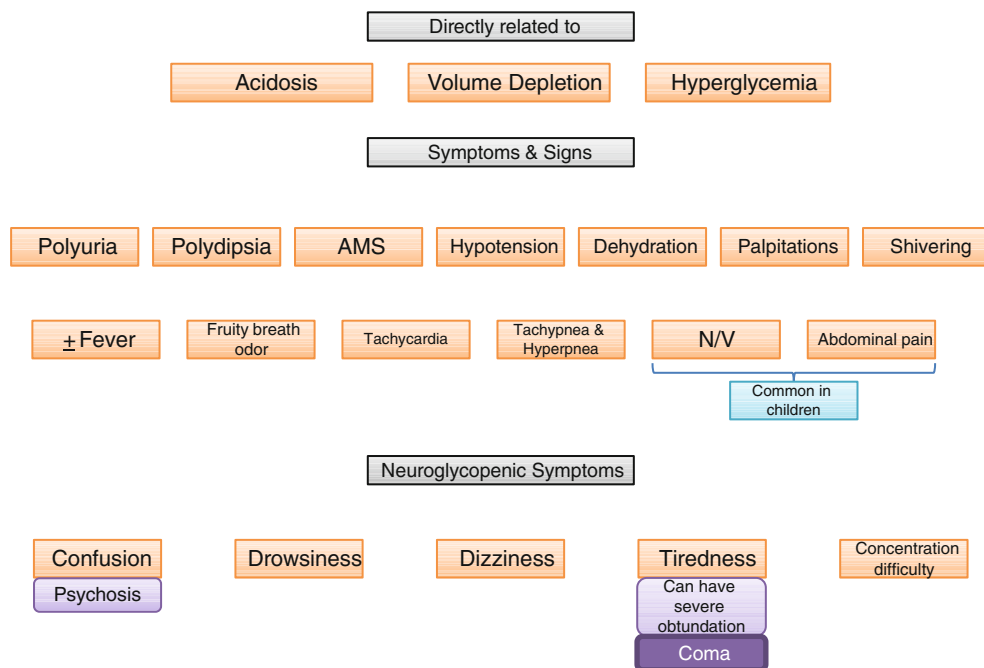
Effects of Hyperglycemia



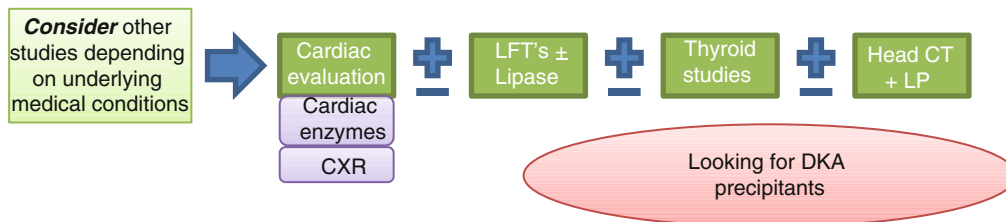
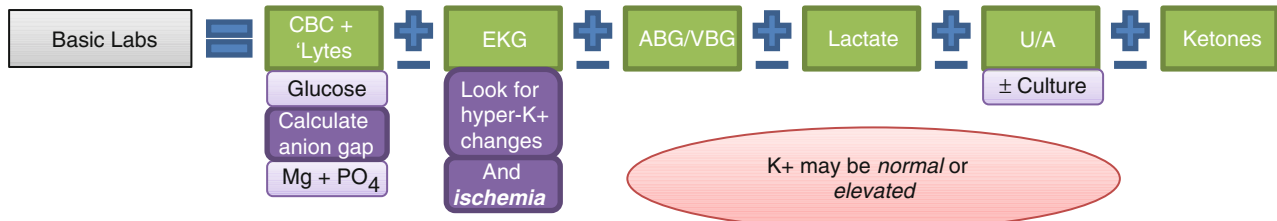
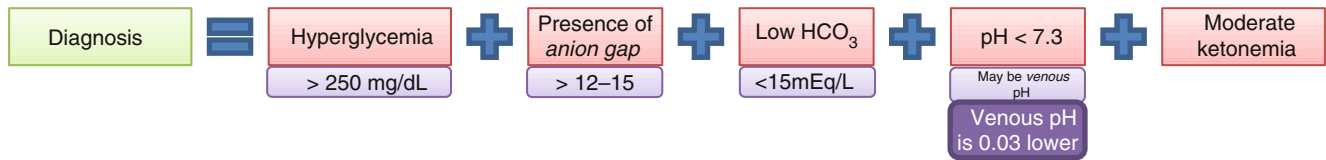
Systemic Effects of Hyperglycemia



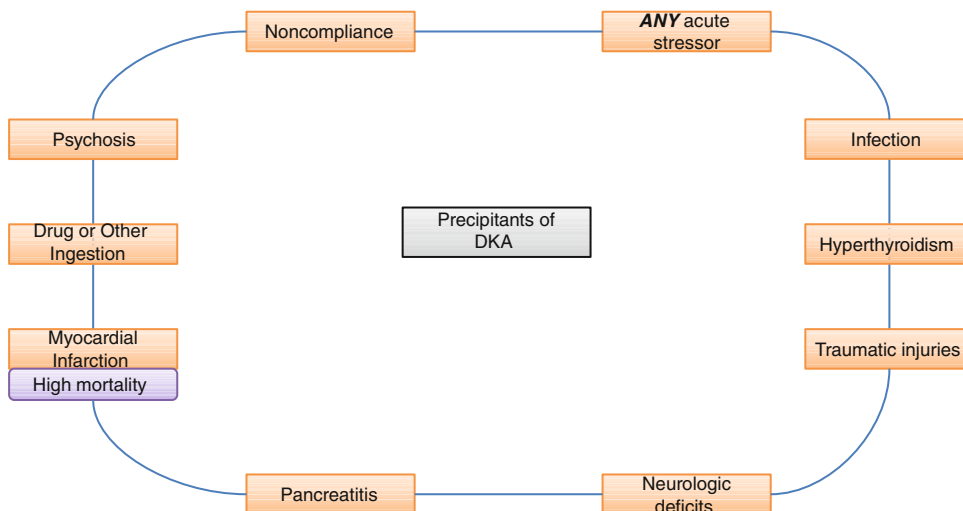
DKA: Clinical Features



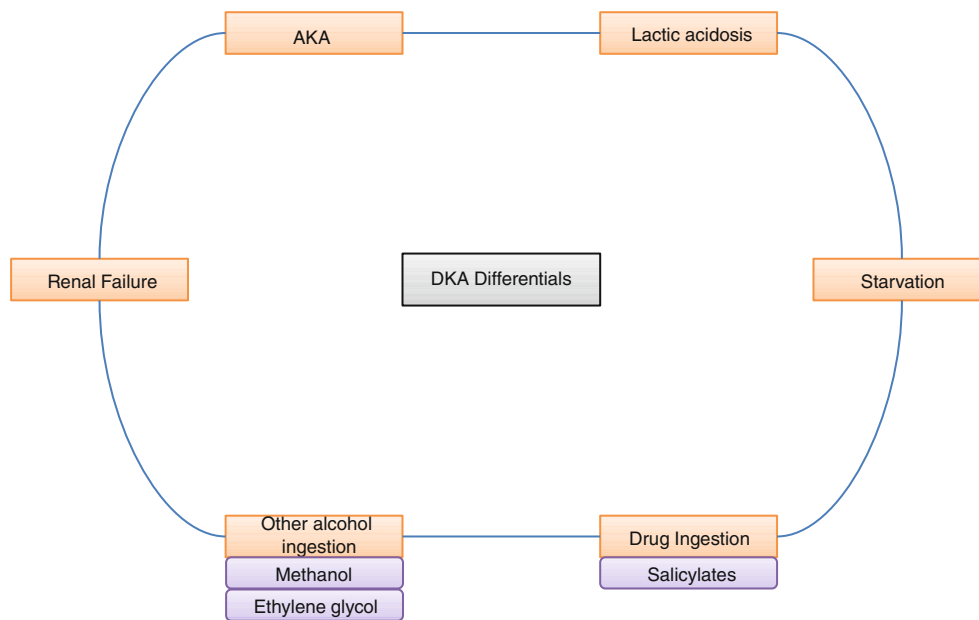
Diagnosis: DKA



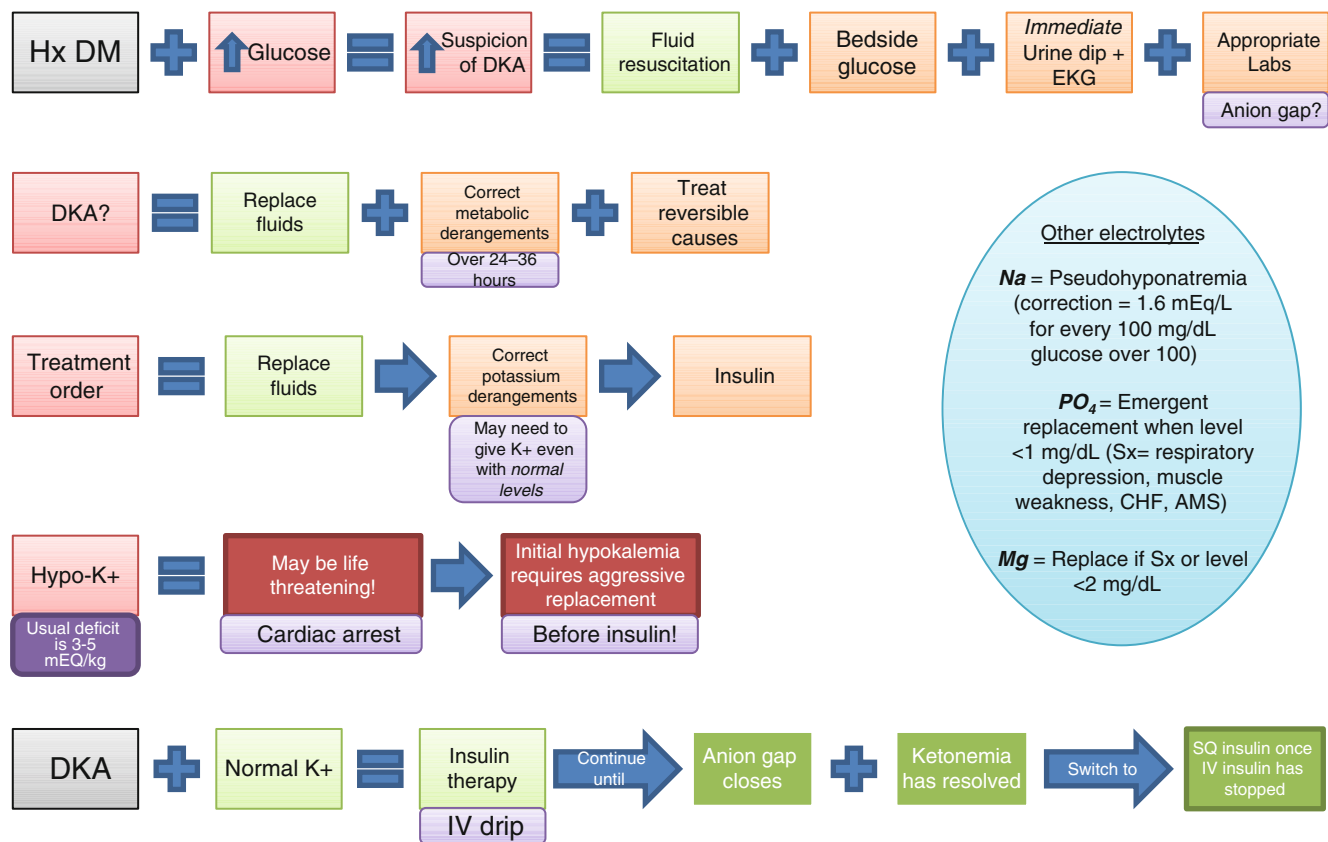
DKA Precipitants



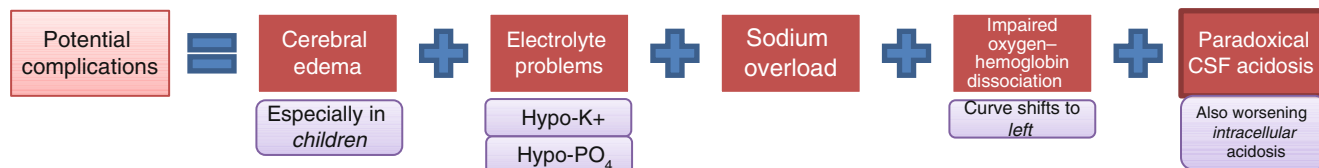
DKA Differential Diagnosis



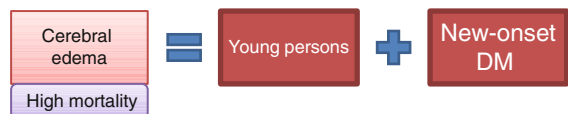
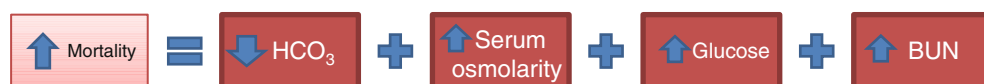
DKA Treatment



Bicarbonate in DKA

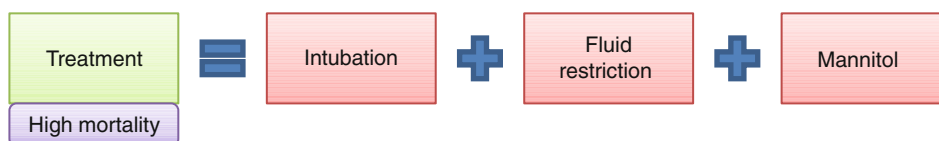


DKA Complications

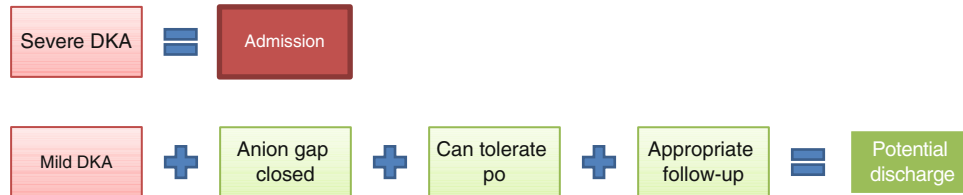


Cerebral Edema

Symptoms/Signs

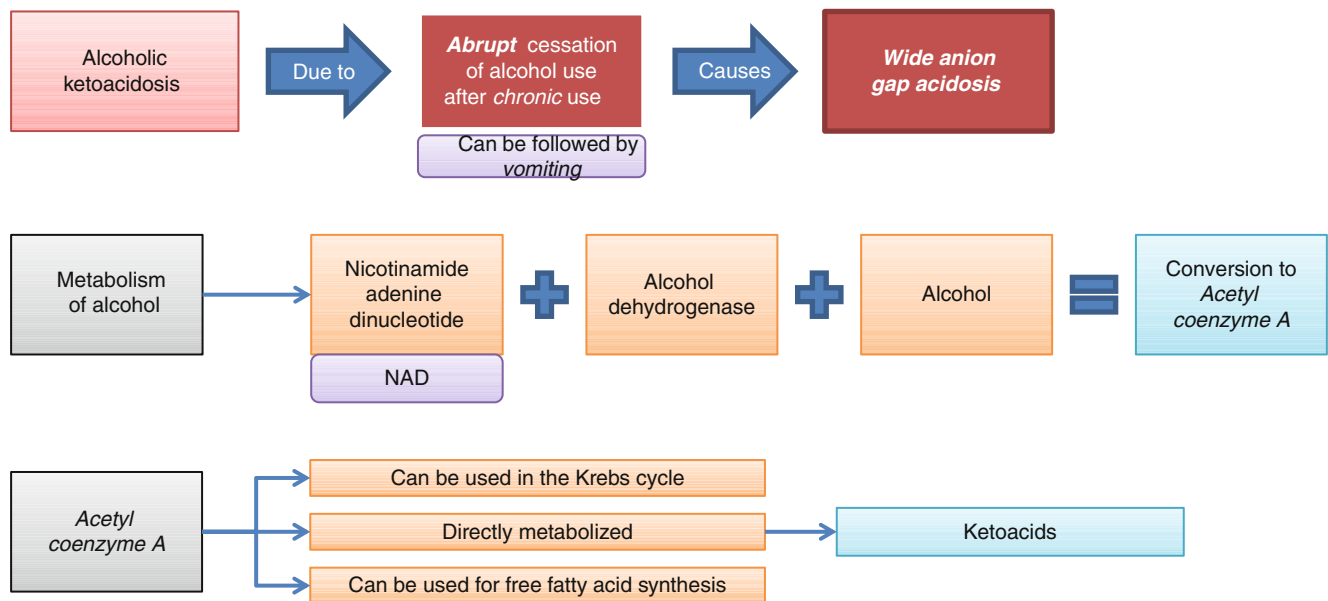


Disposition

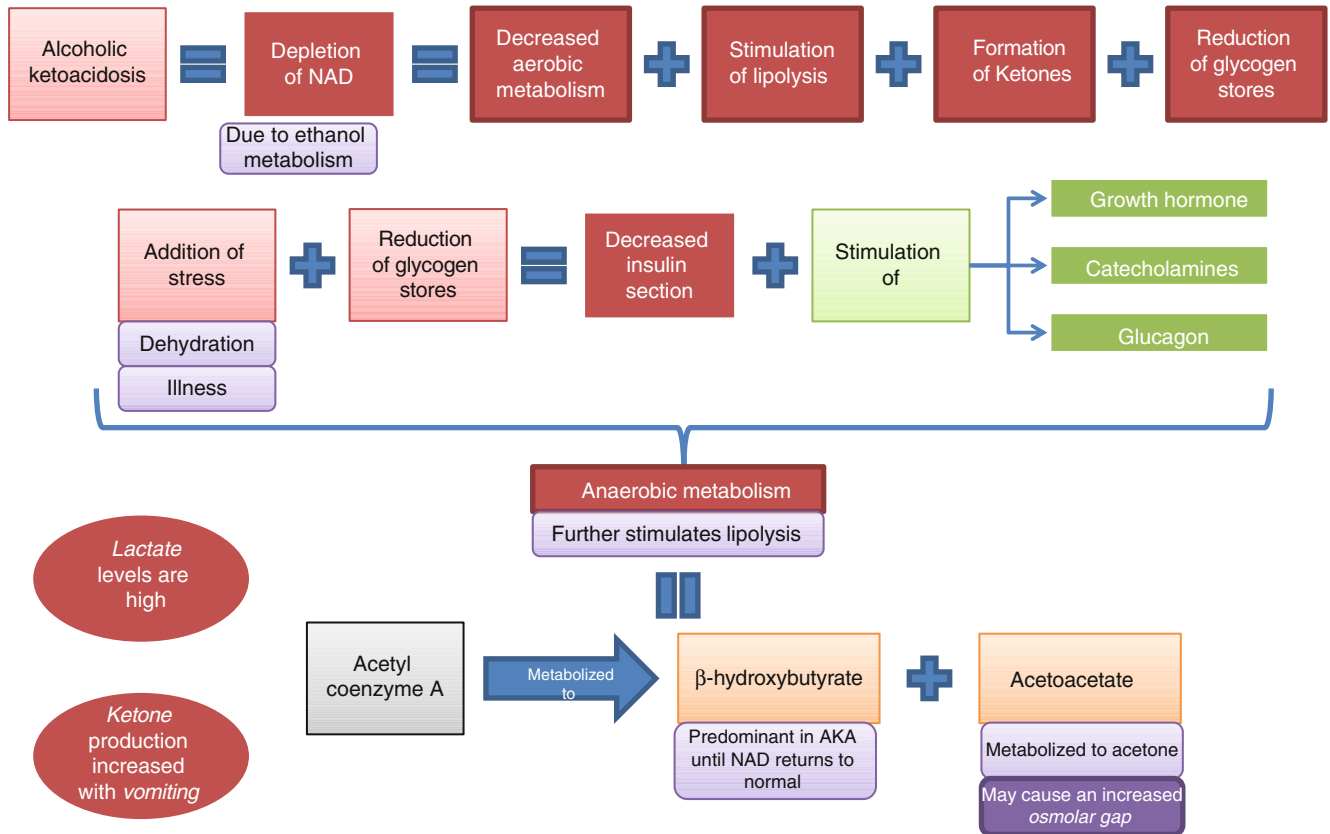


Alcoholic Ketoacidosis

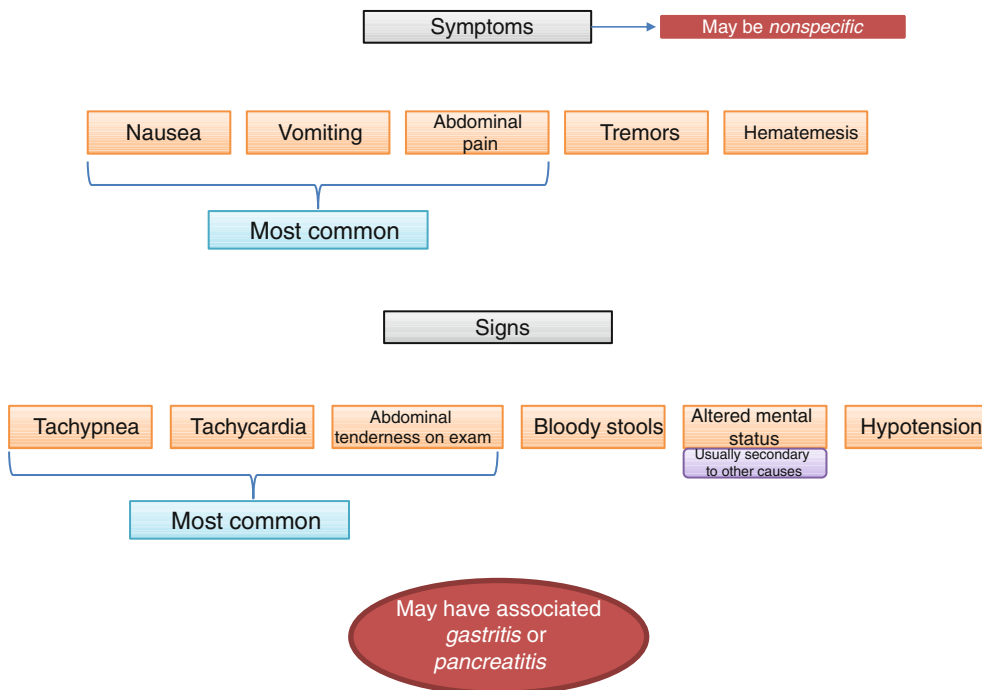
Introduction



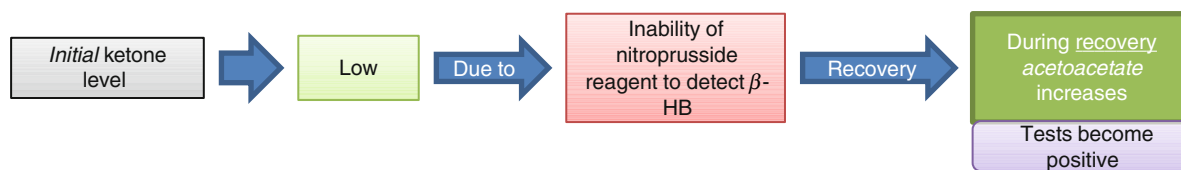
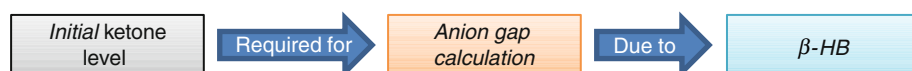
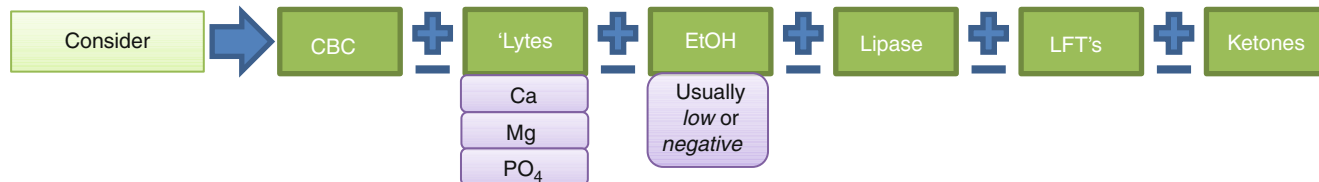
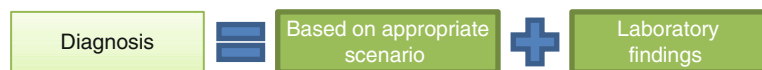
Pathophysiology



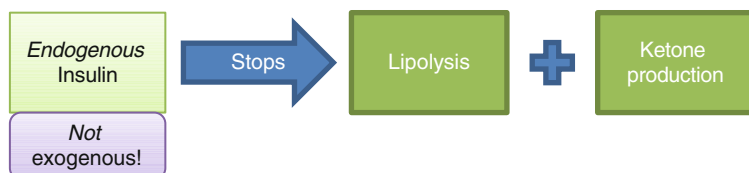
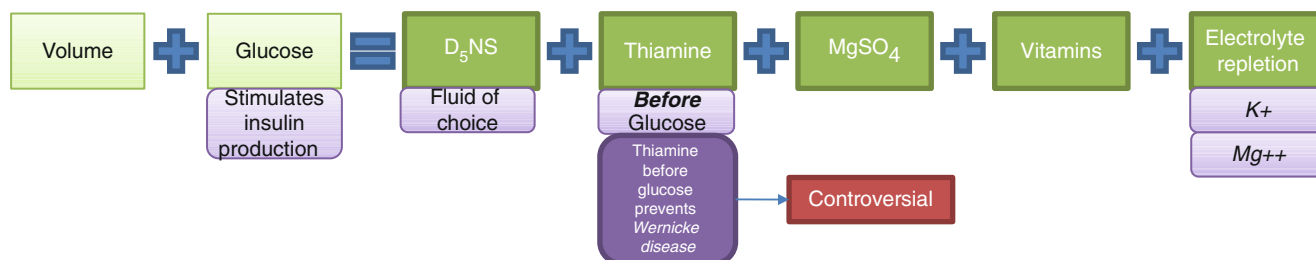
Alcoholic Ketoacidosis: Clinical Features



Diagnosis



Treatment

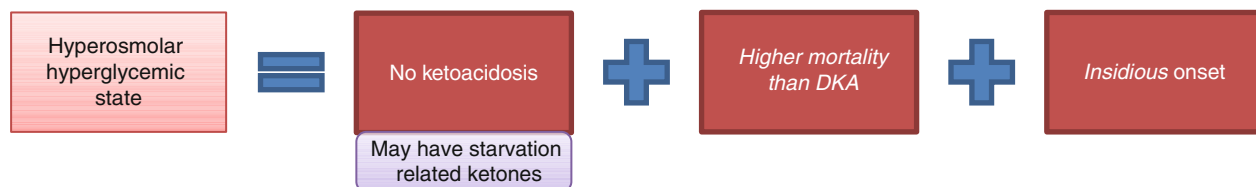
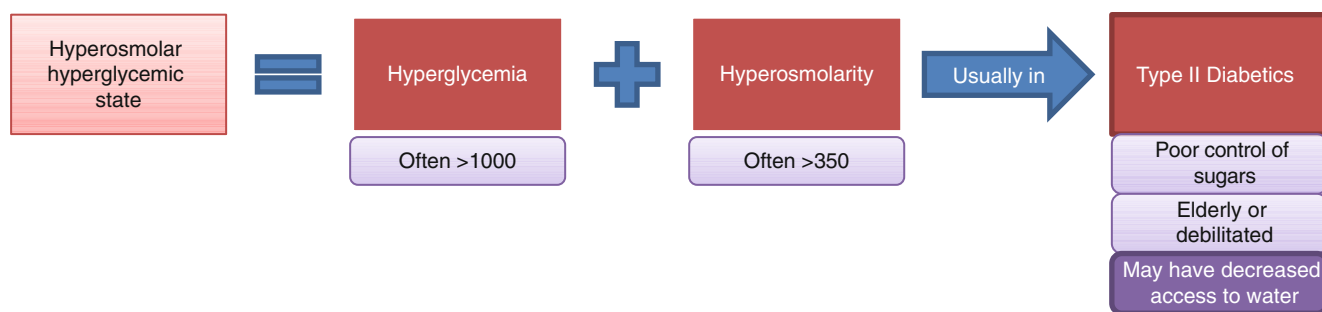


Disposition

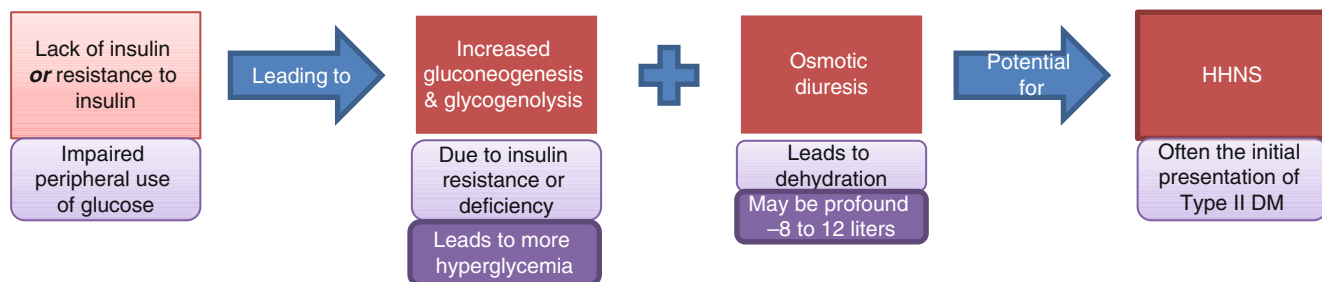


Hyperosmolar Hyperglycemic Nonketotic Syndrome

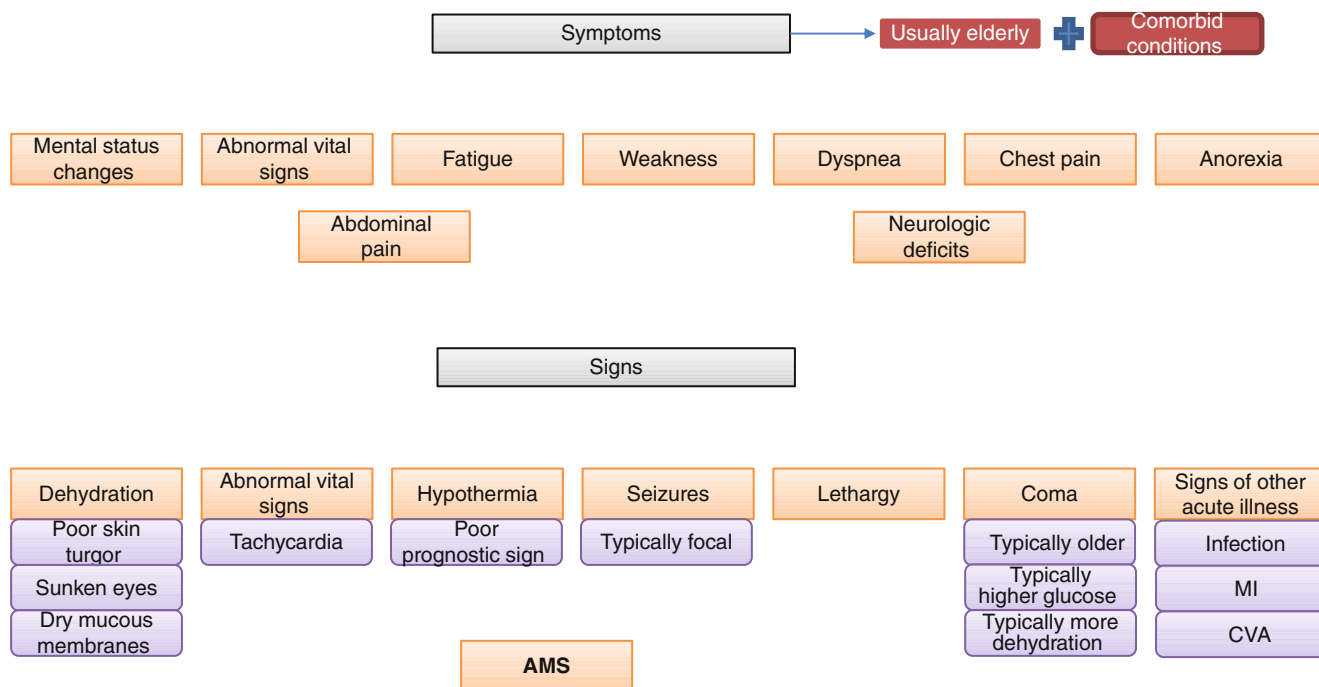
Introduction



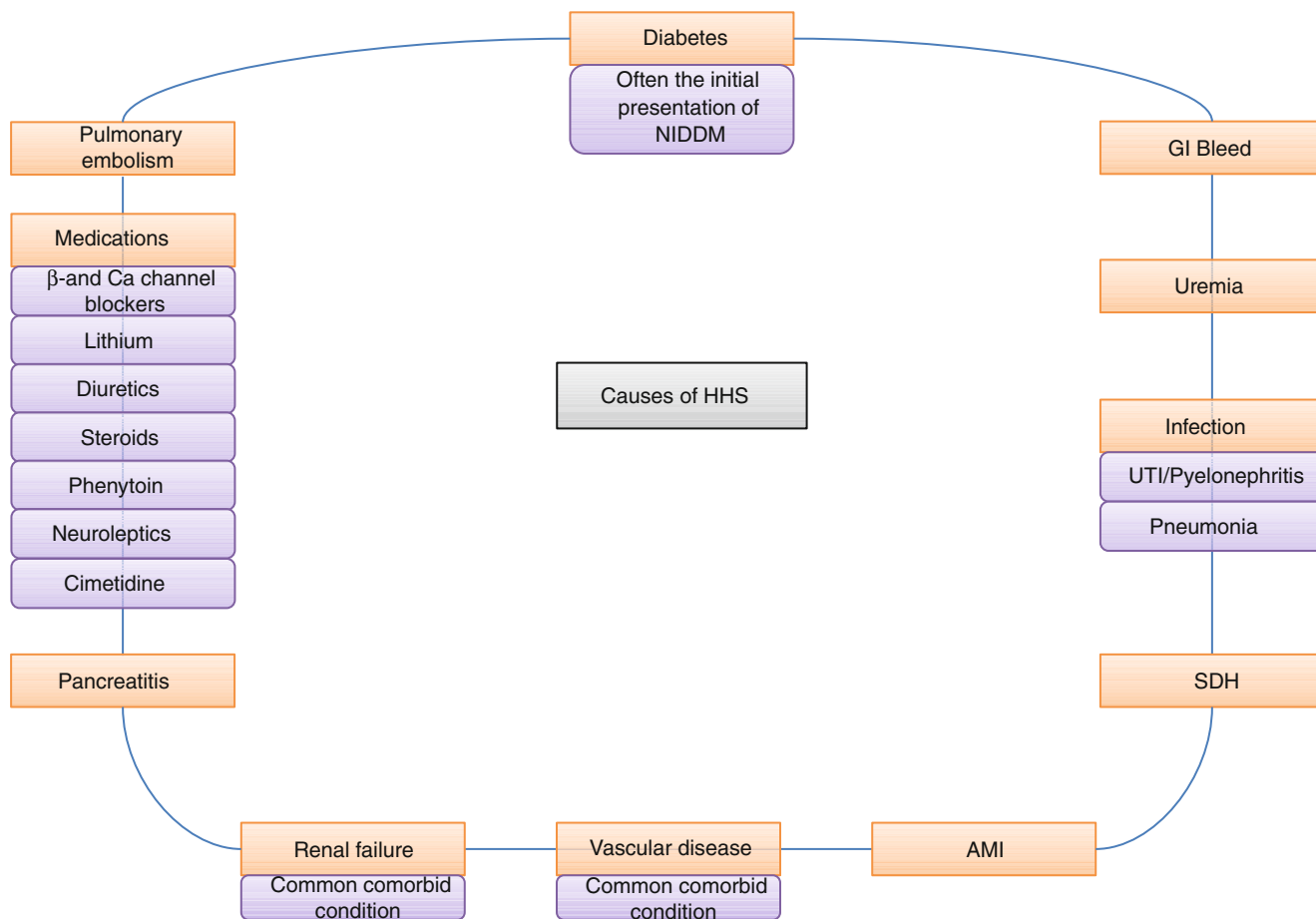
Pathophysiology



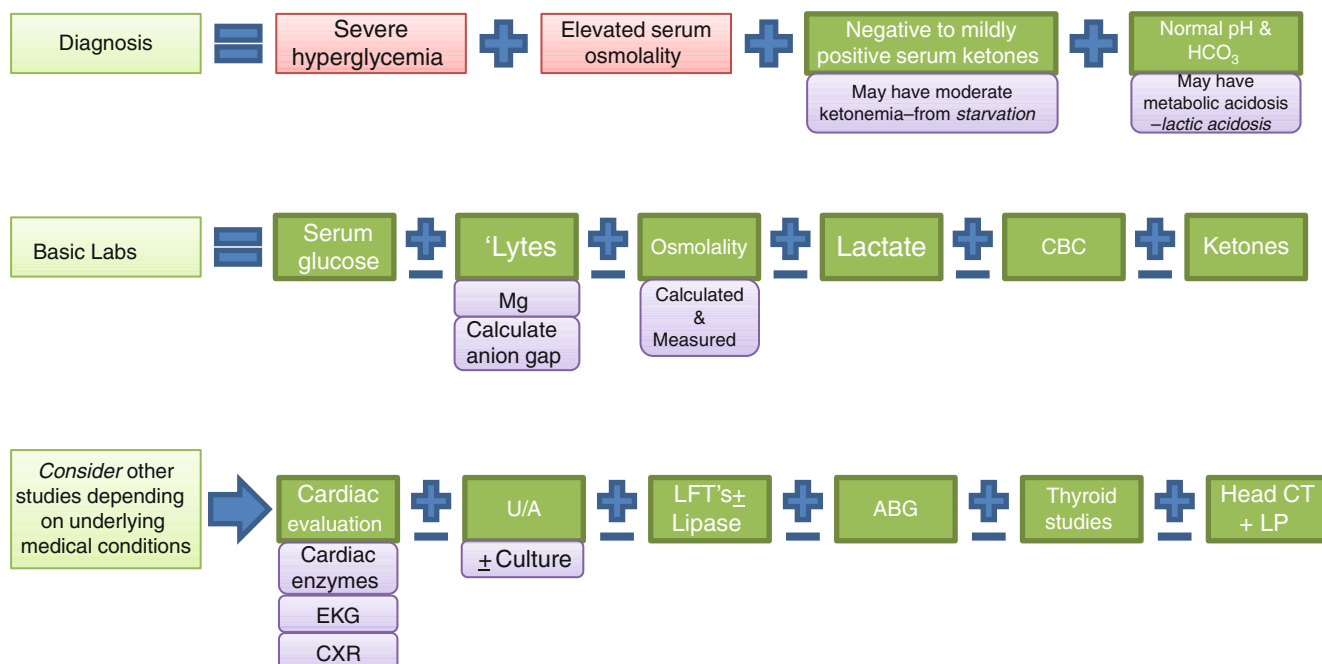
HHNS: Clinical Features



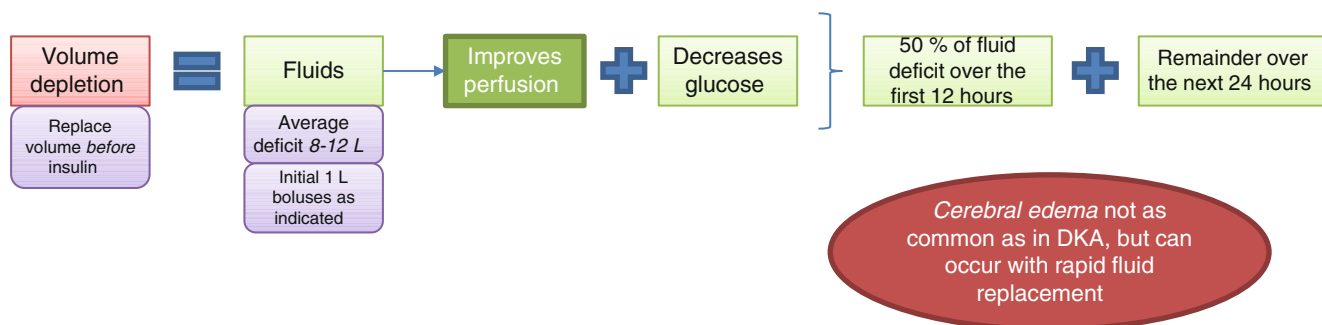
Precipitating Factors for HHNS



Diagnosis



Treatment

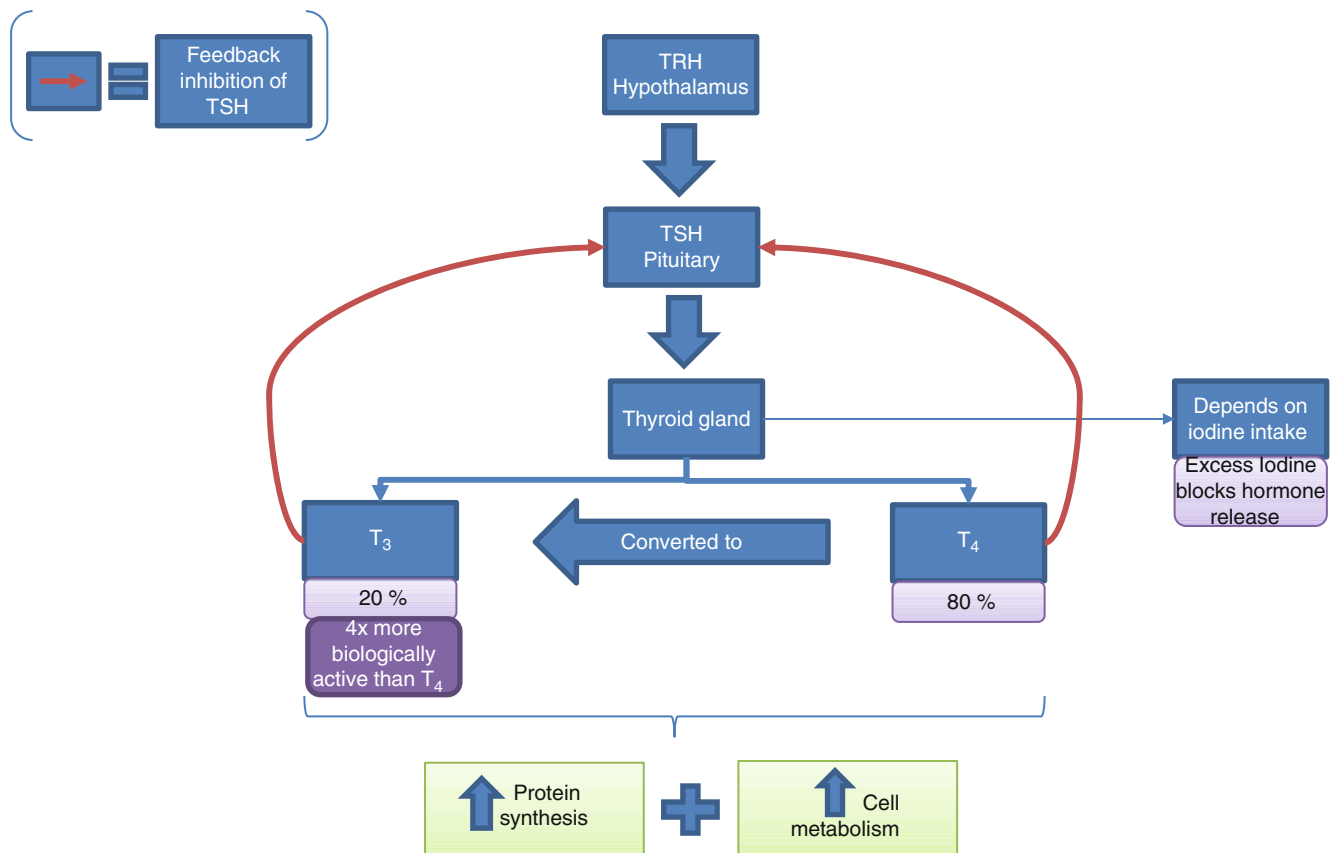


Disposition



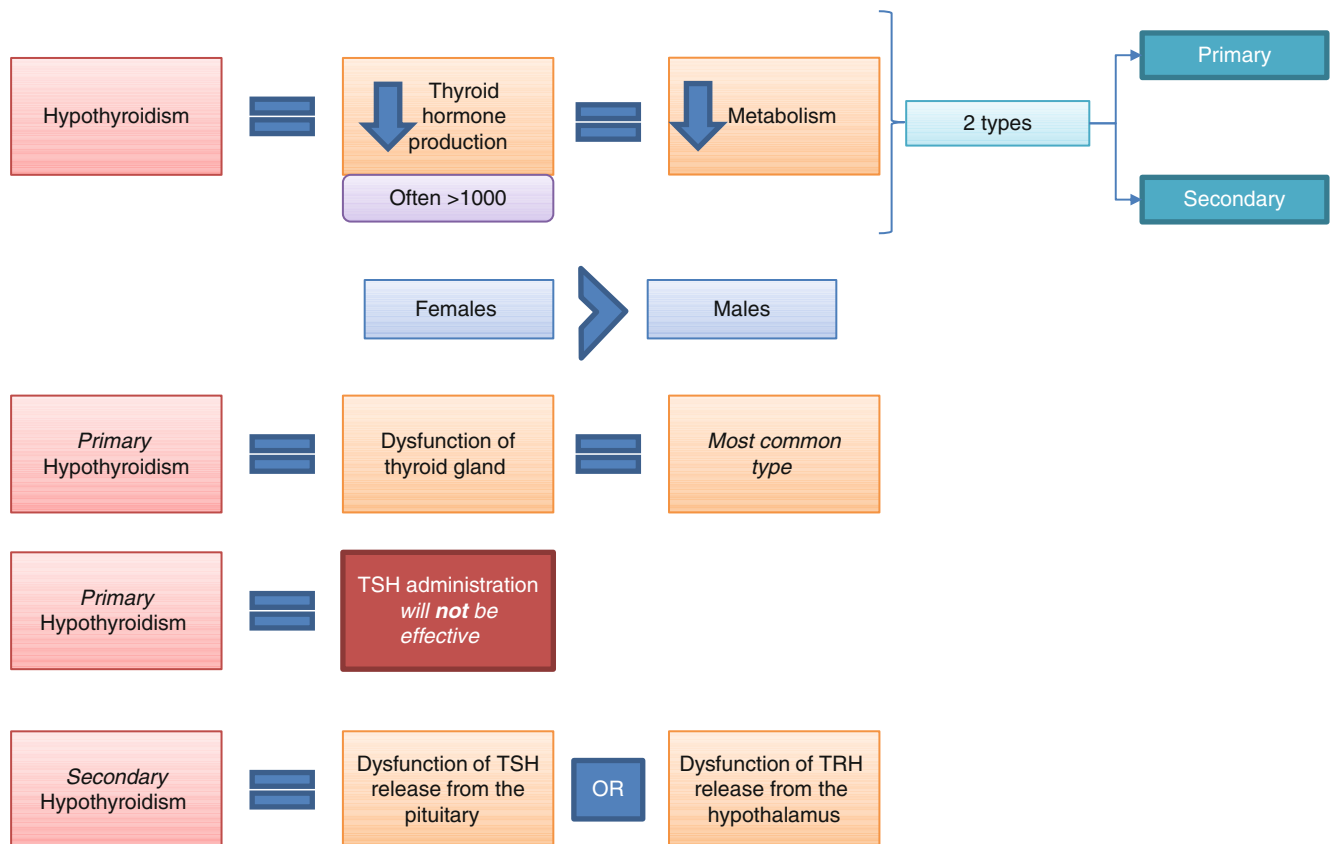
Thyroid Disorders

Thyroid Hormones

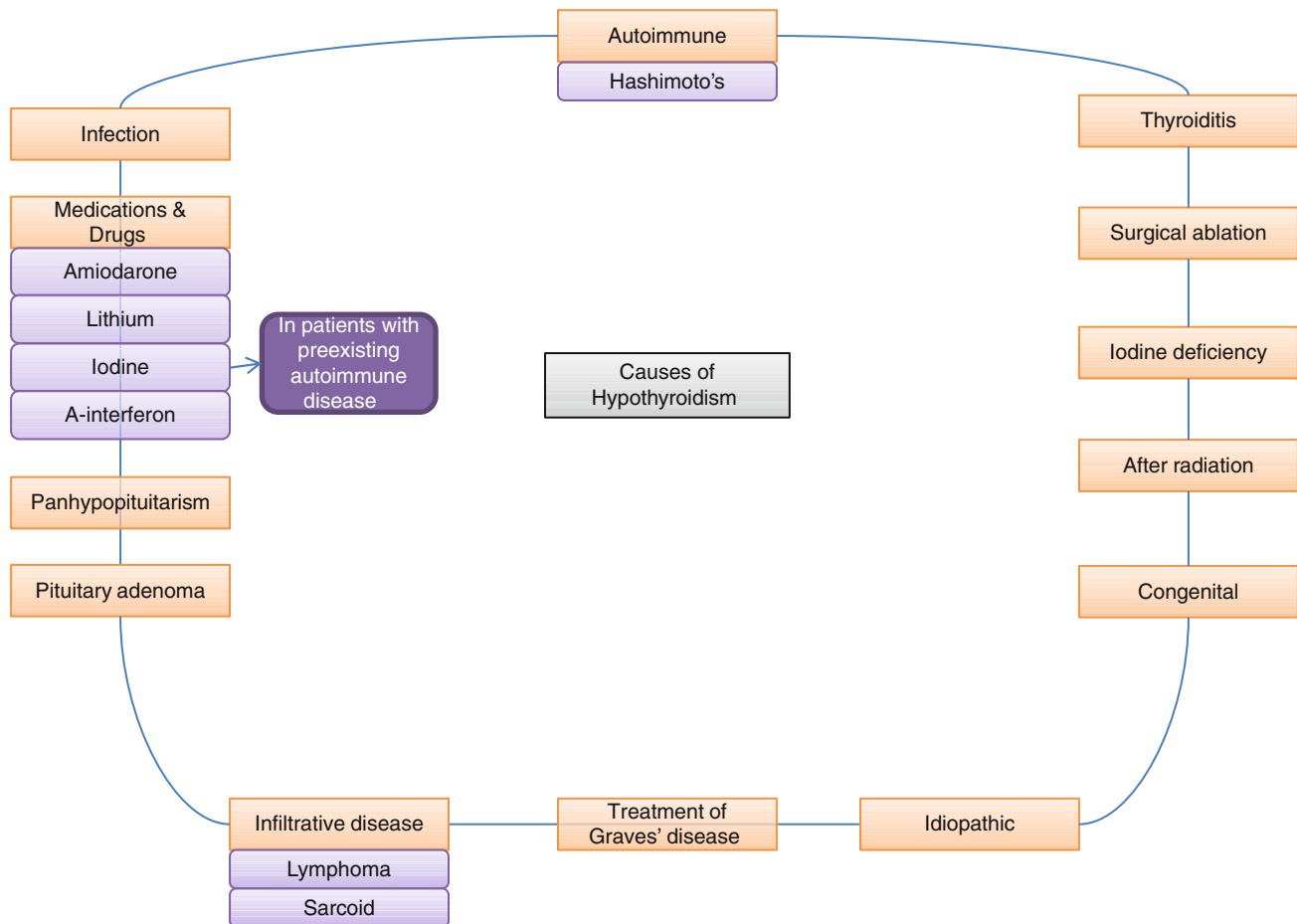


Hypothyroidism and Myxedema Coma

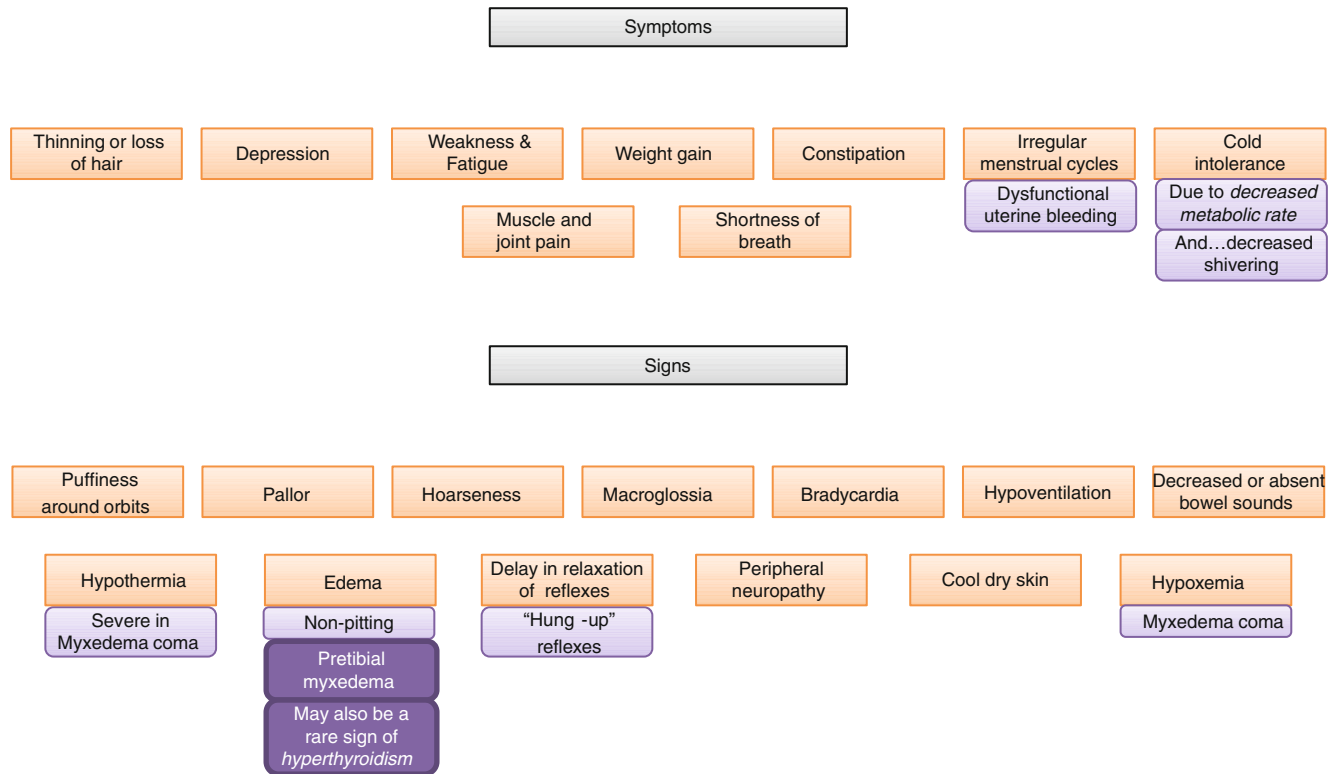
Introduction: Hypothyroidism



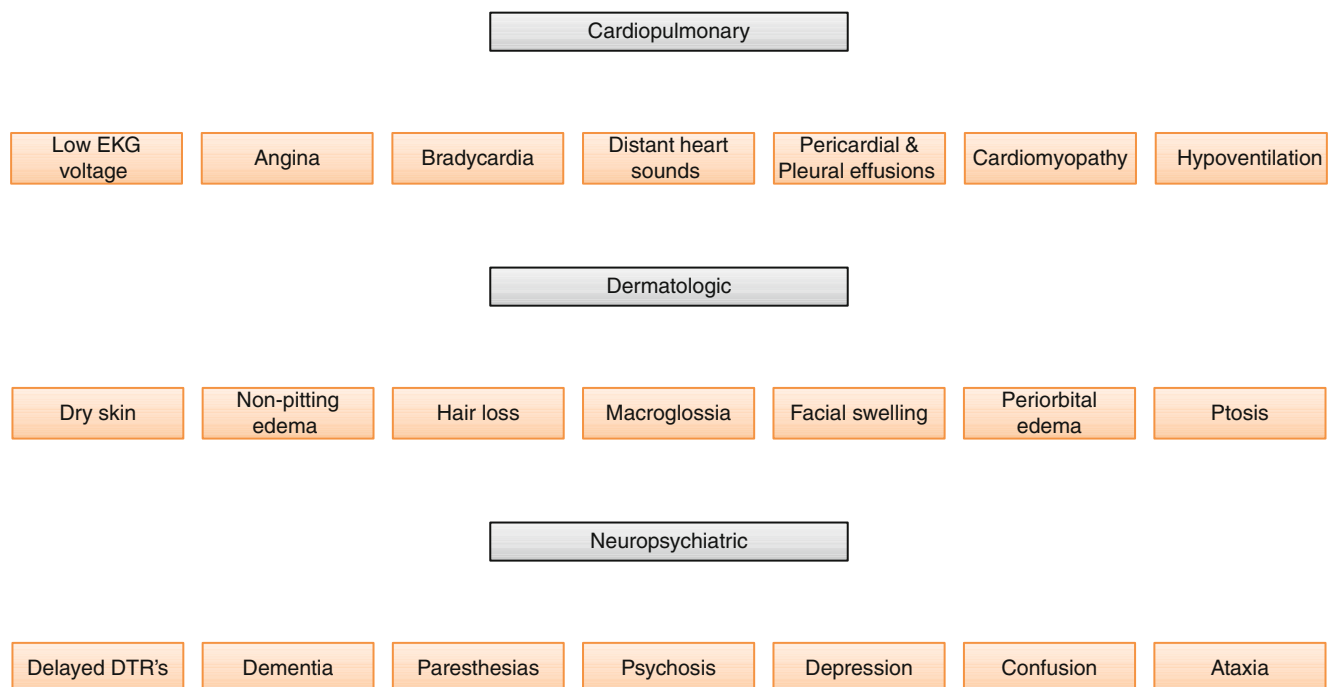
Some Causes of Hypothyroidism



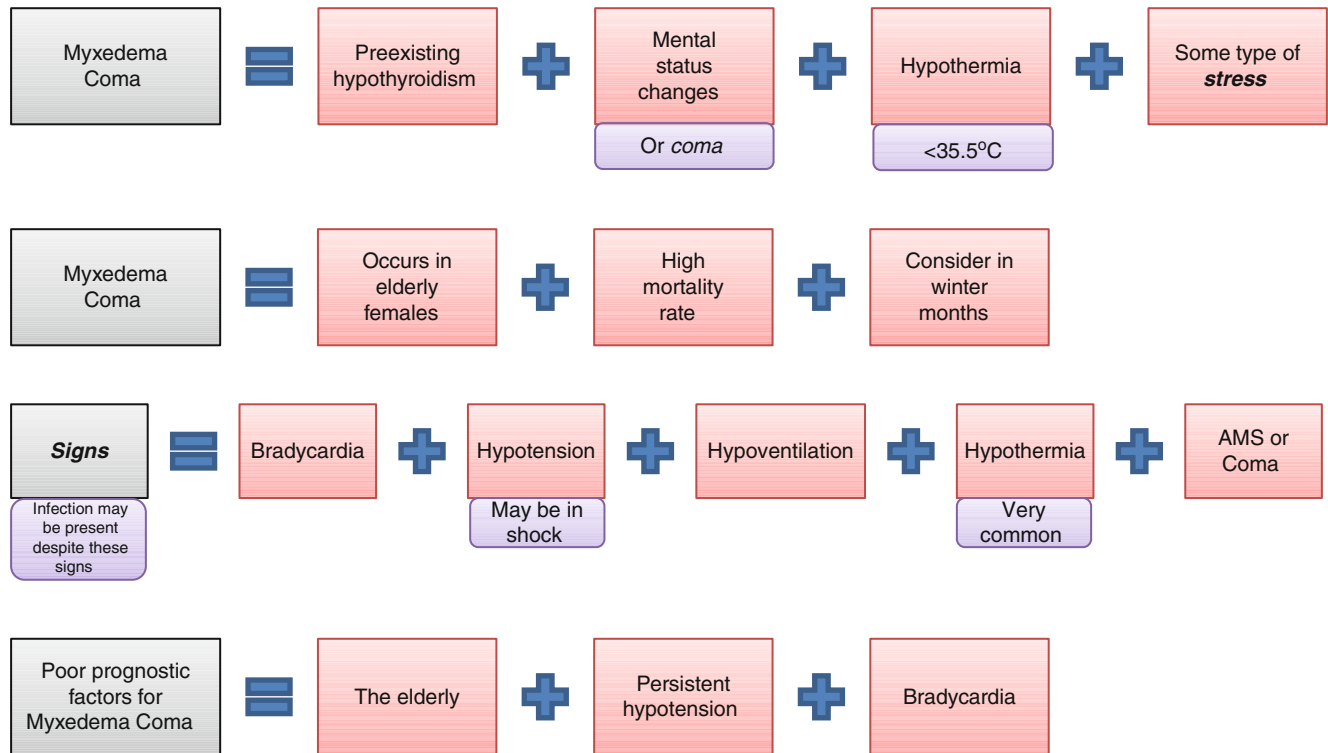
Hypothyroidism: Clinical Features



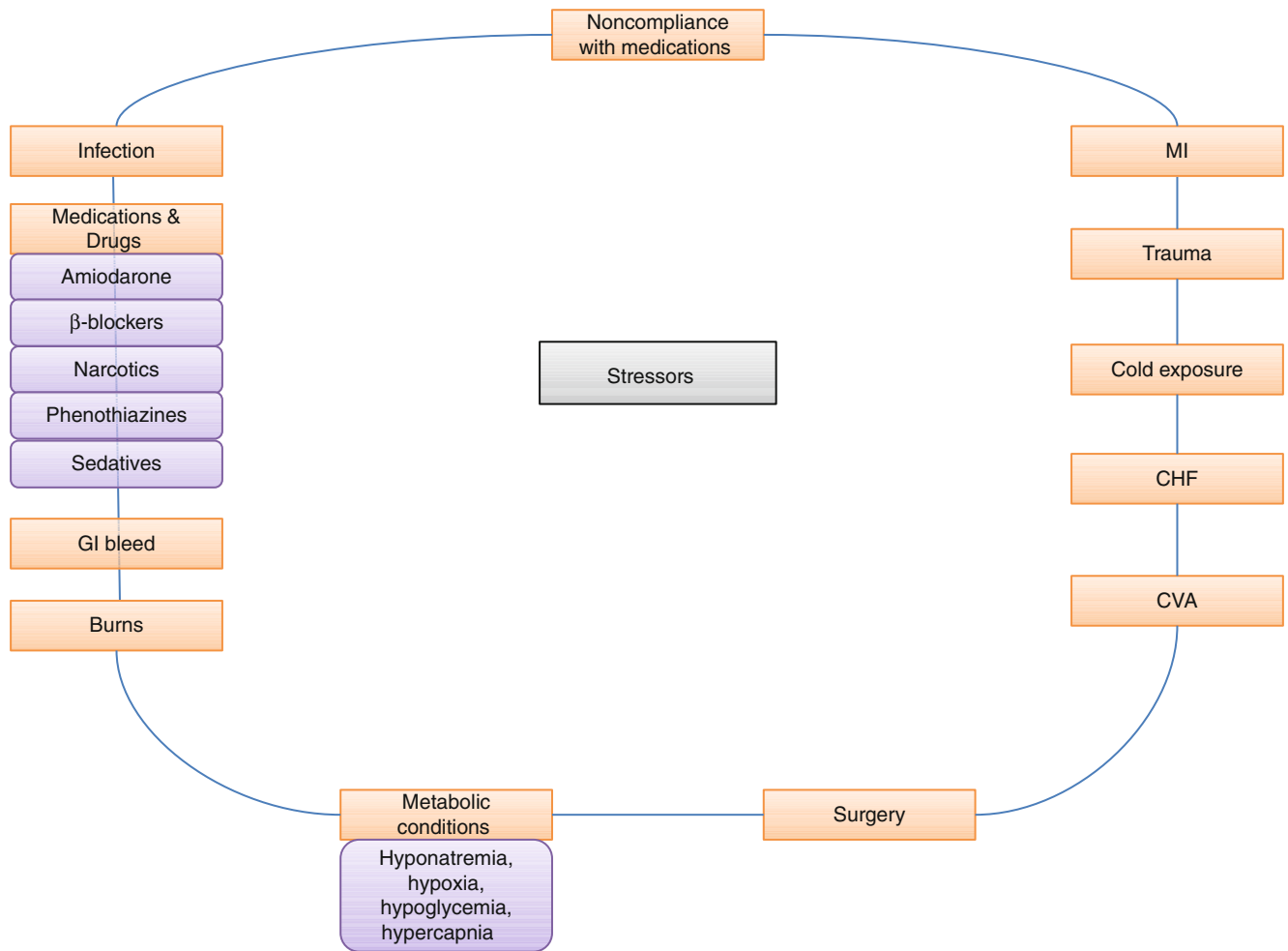
Severe Hypothyroidism: Specific Clinical Features



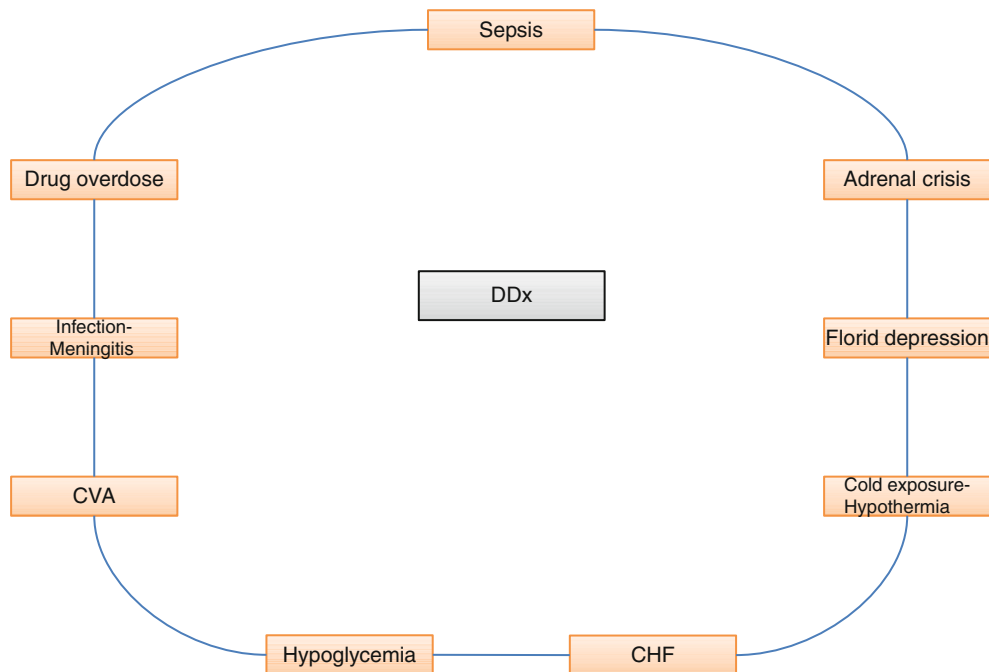
Myxedema Coma



Precipitating Factors of Myxedema Coma



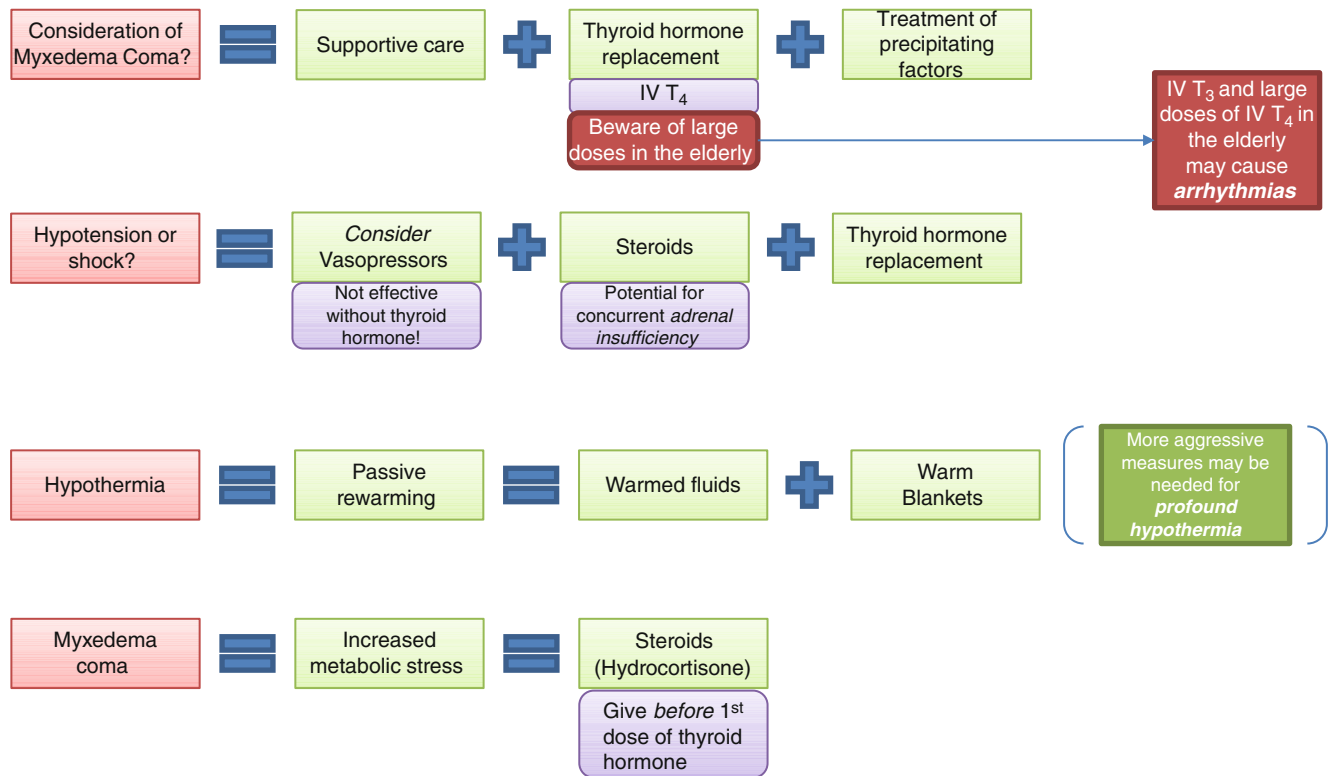
Differential Diagnosis of Myxedema Coma



Myxedema Diagnosis



Treatment

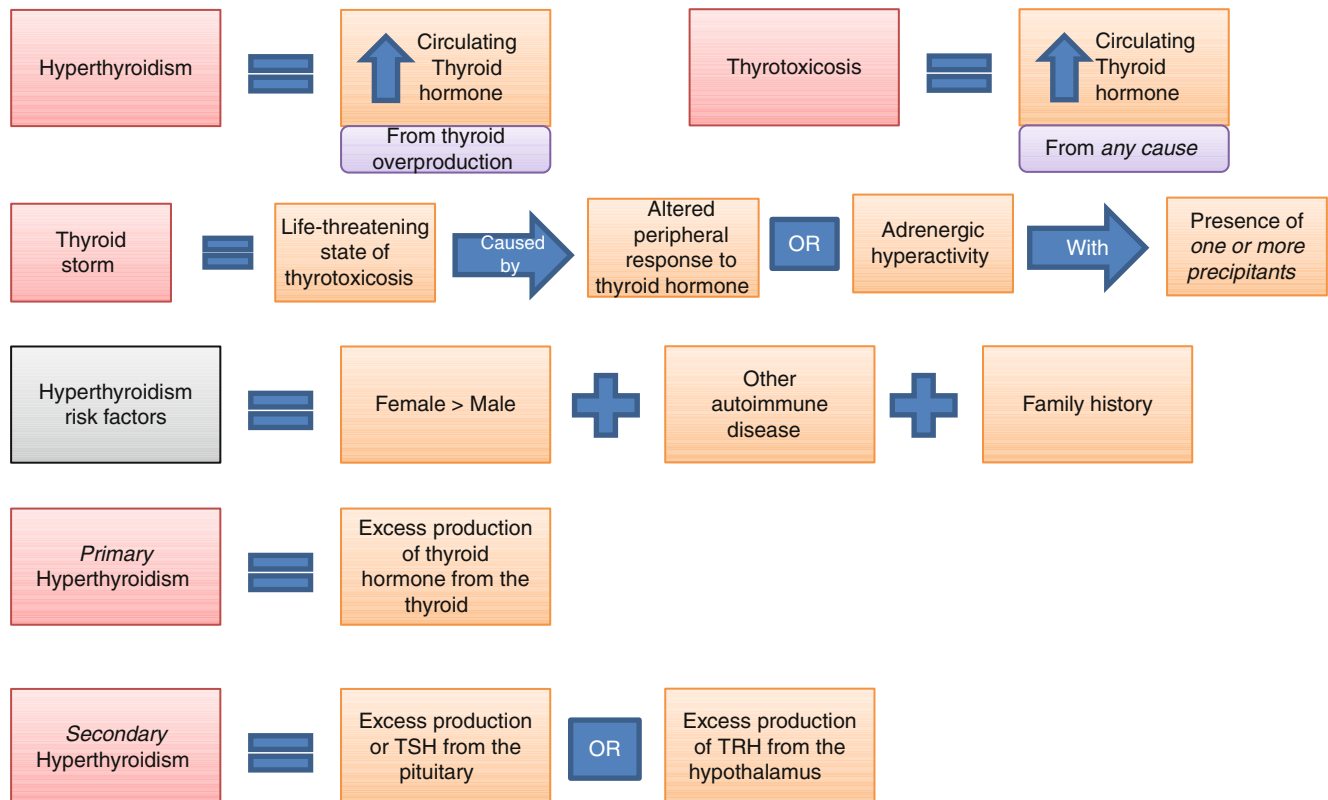


Disposition

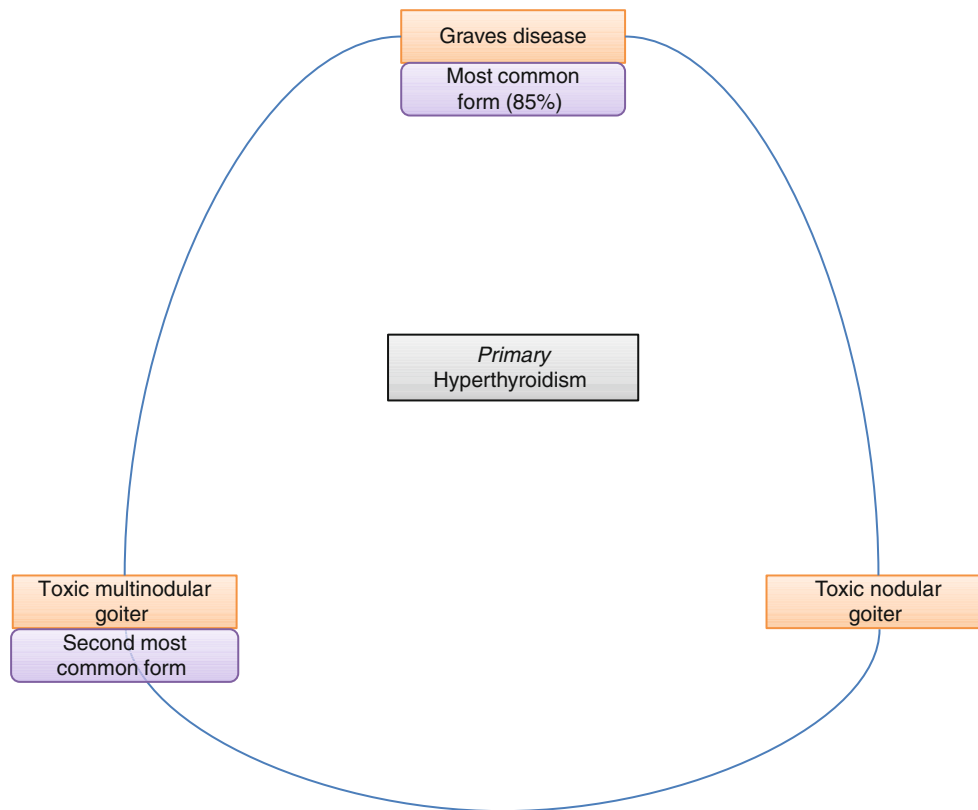


Hyperthyroidism and Thyroid Storm

Introduction: Hyperthyroidism



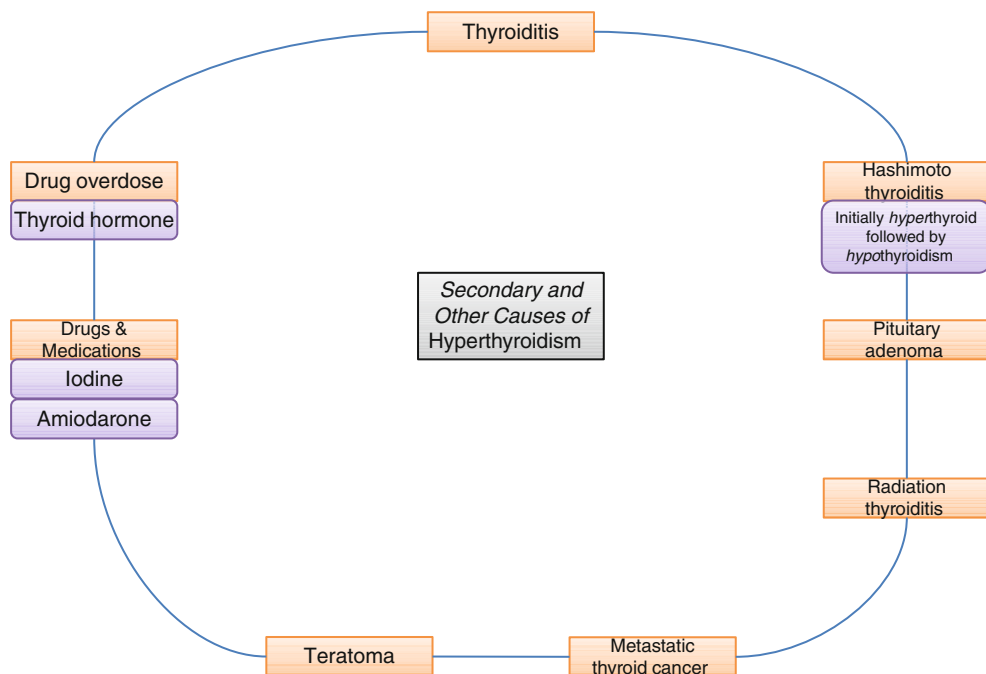
Causes of Primary Hyperthyroidism



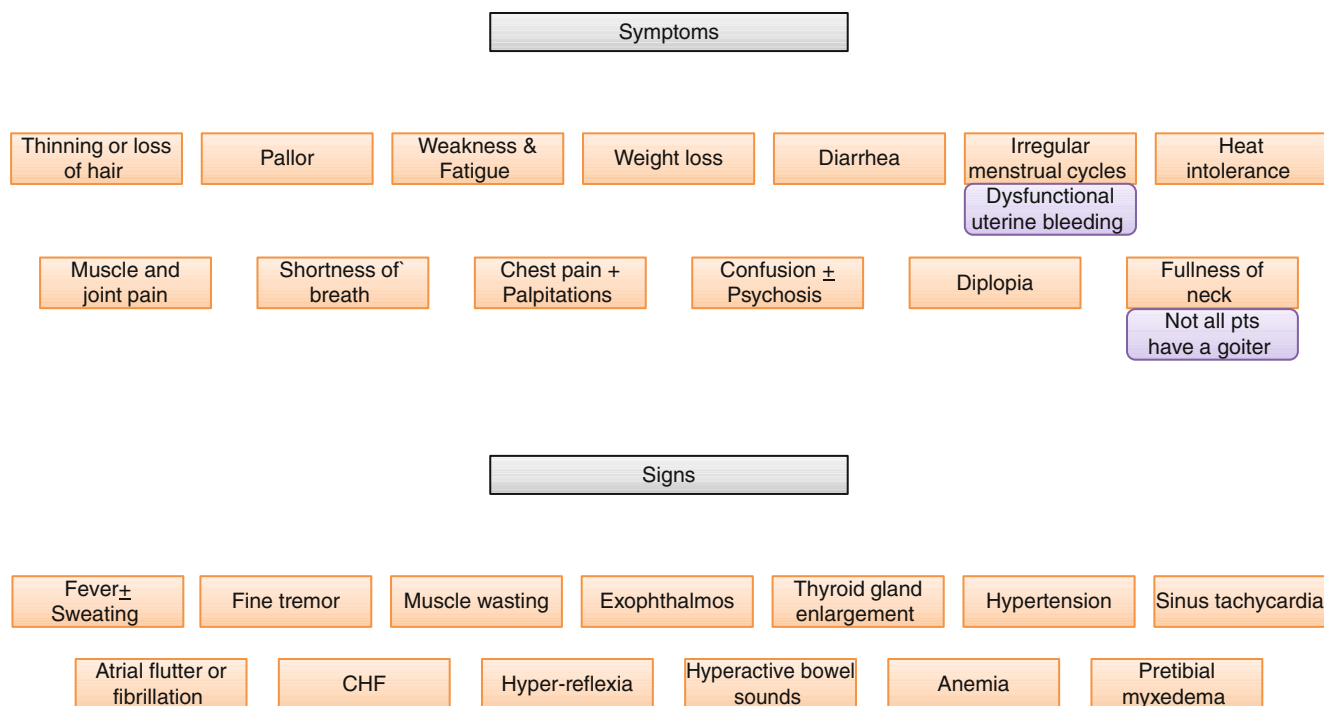
Graves' Disease



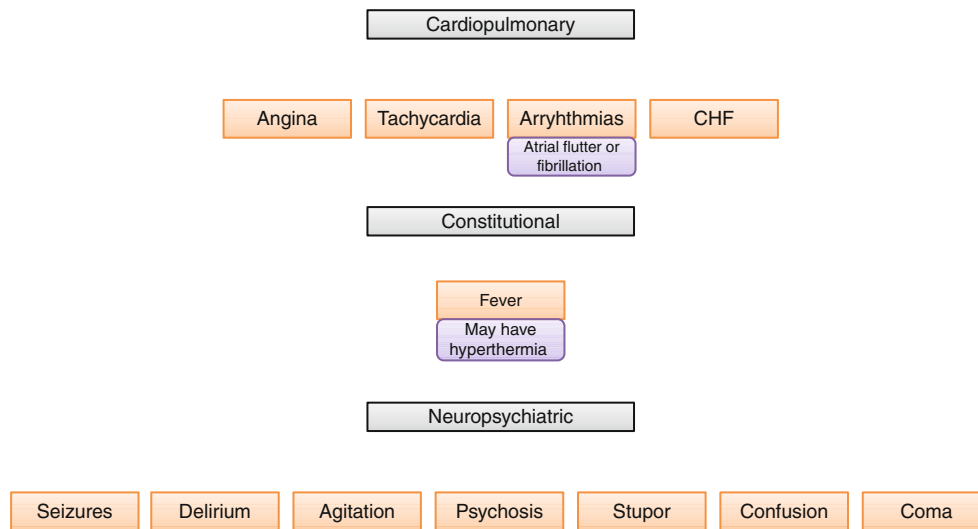
Causes of Hyperthyroidism



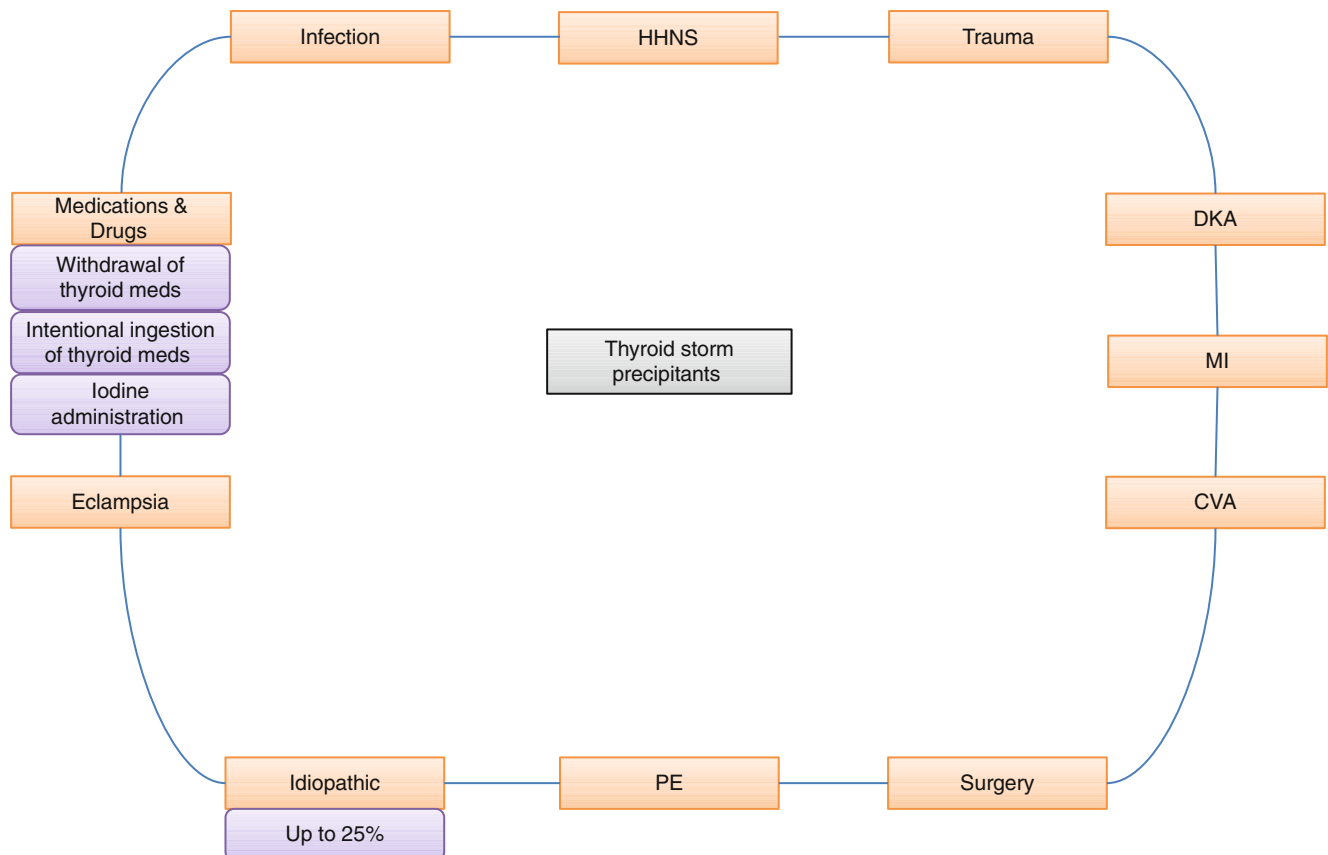
Hyperthyroidism: Clinical Features



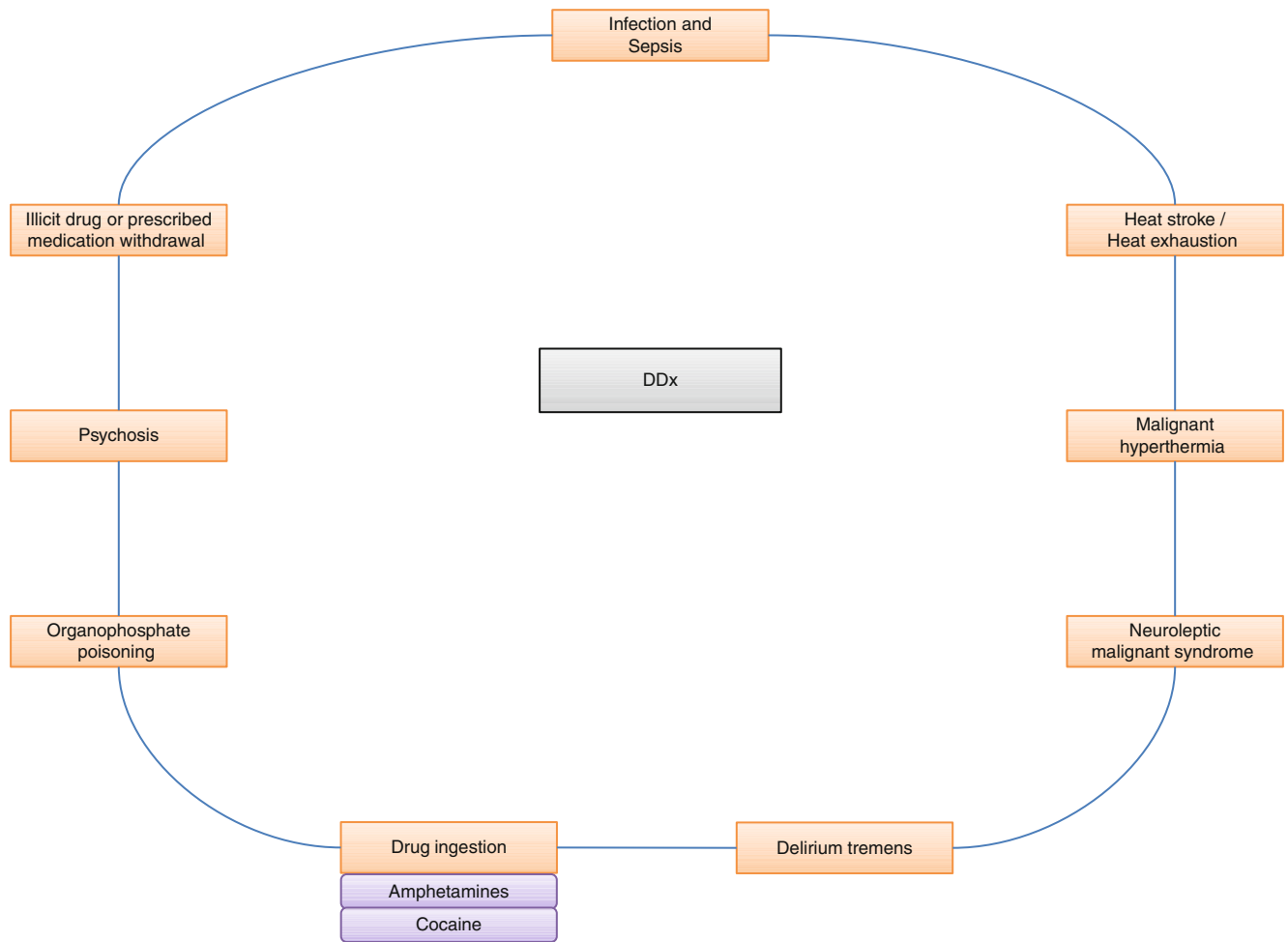
Thyroid Storm: Specific Clinical Features



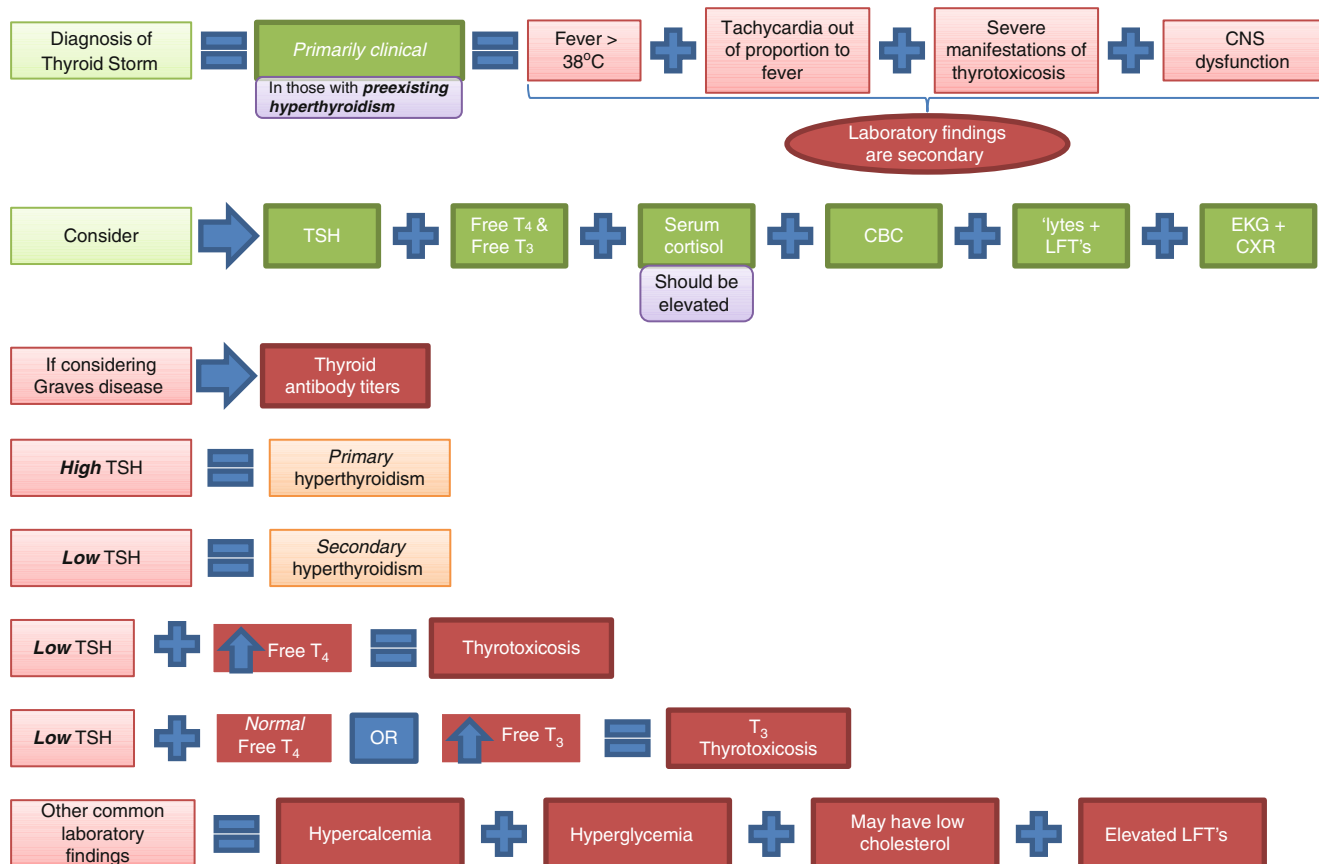
Precipitating Factors of Thyroid Storm



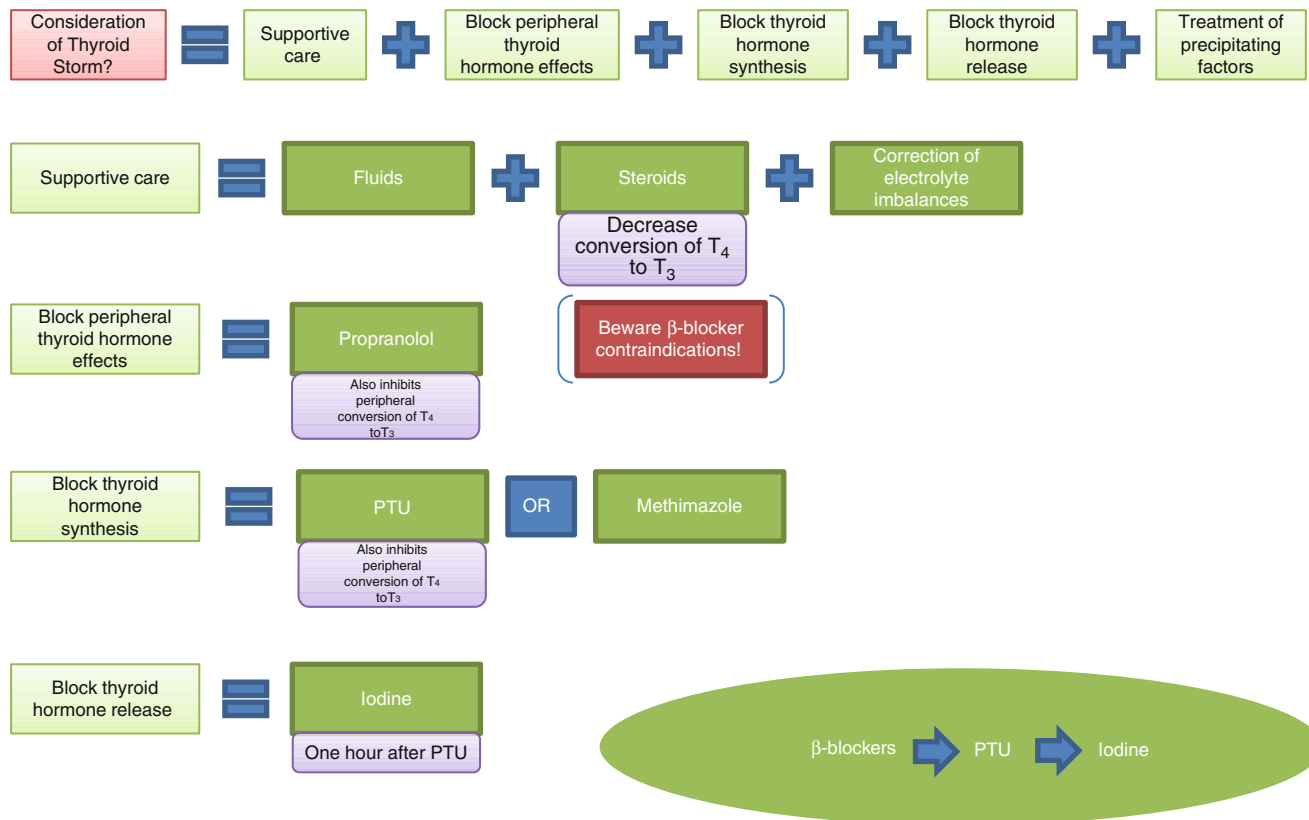
Differential Diagnosis of Thyroid Storm



Thyroid Storm Diagnosis



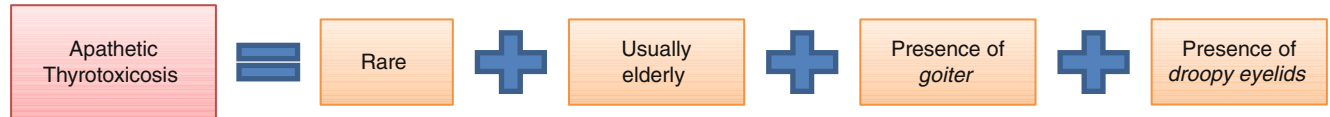
Treatment



Disposition

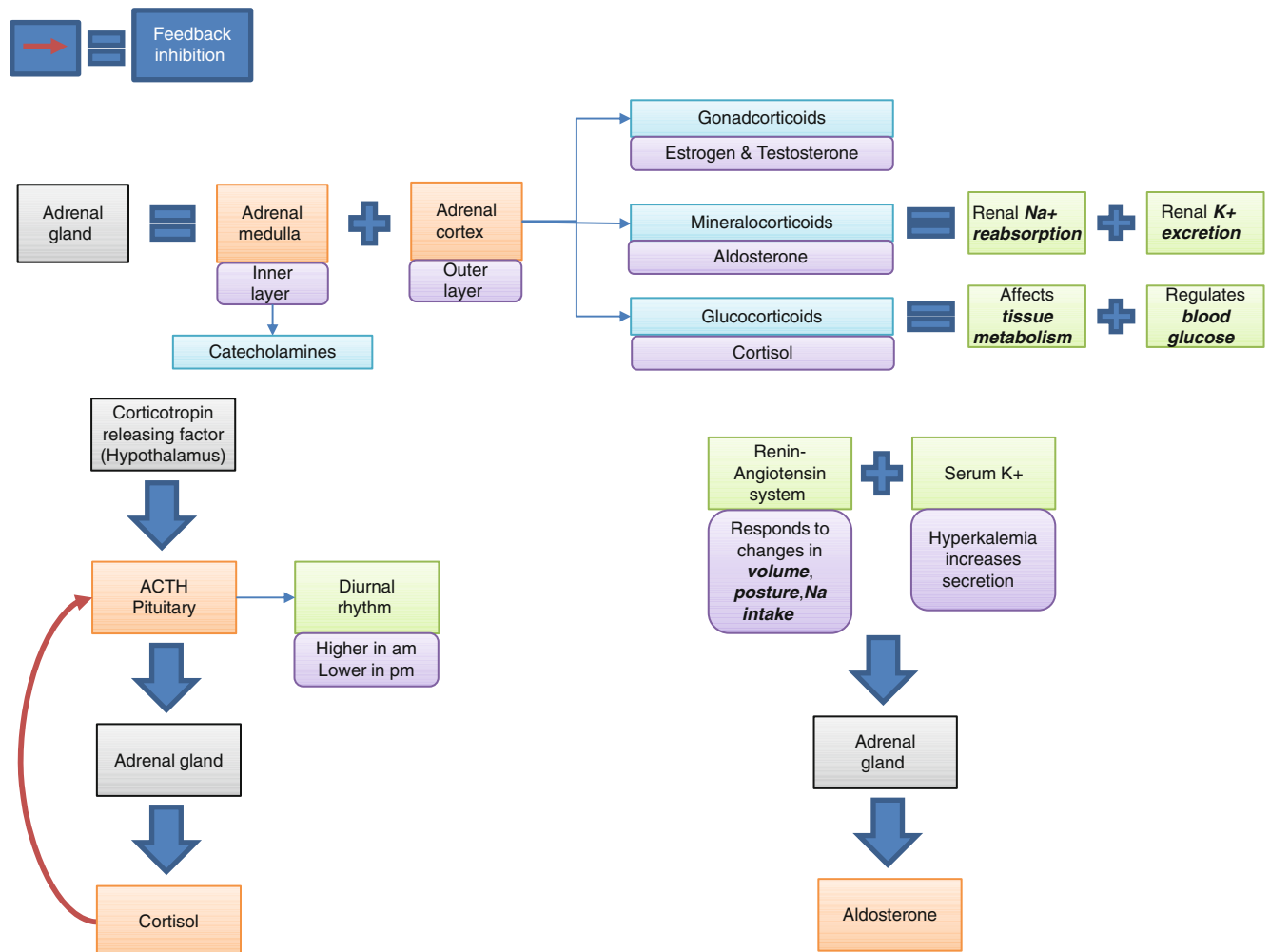


Apathetic Thyrotoxicosis

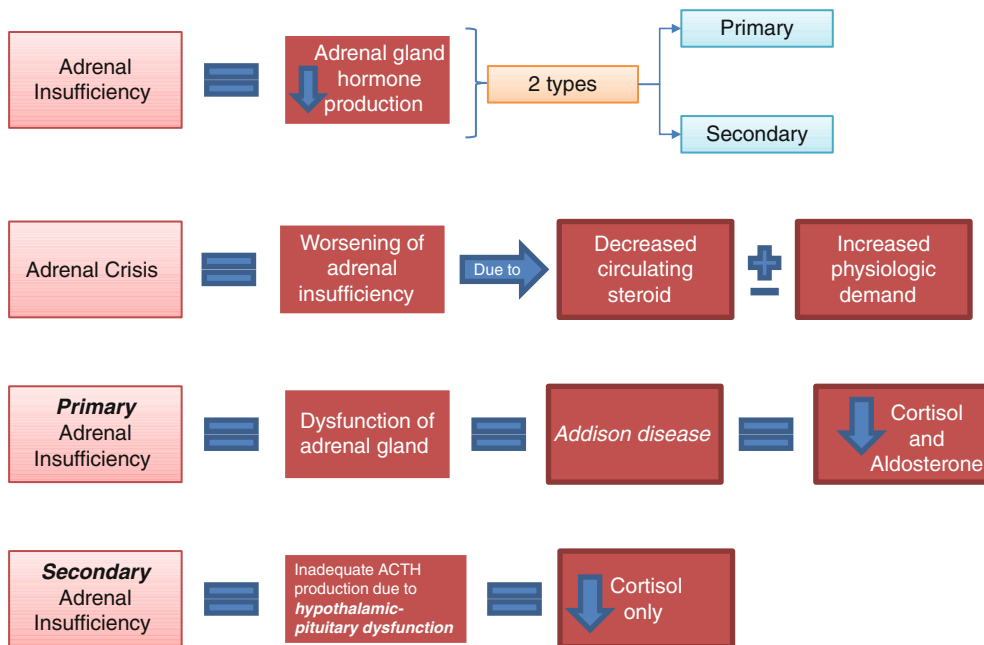


Adrenal Insufficiency and Crisis

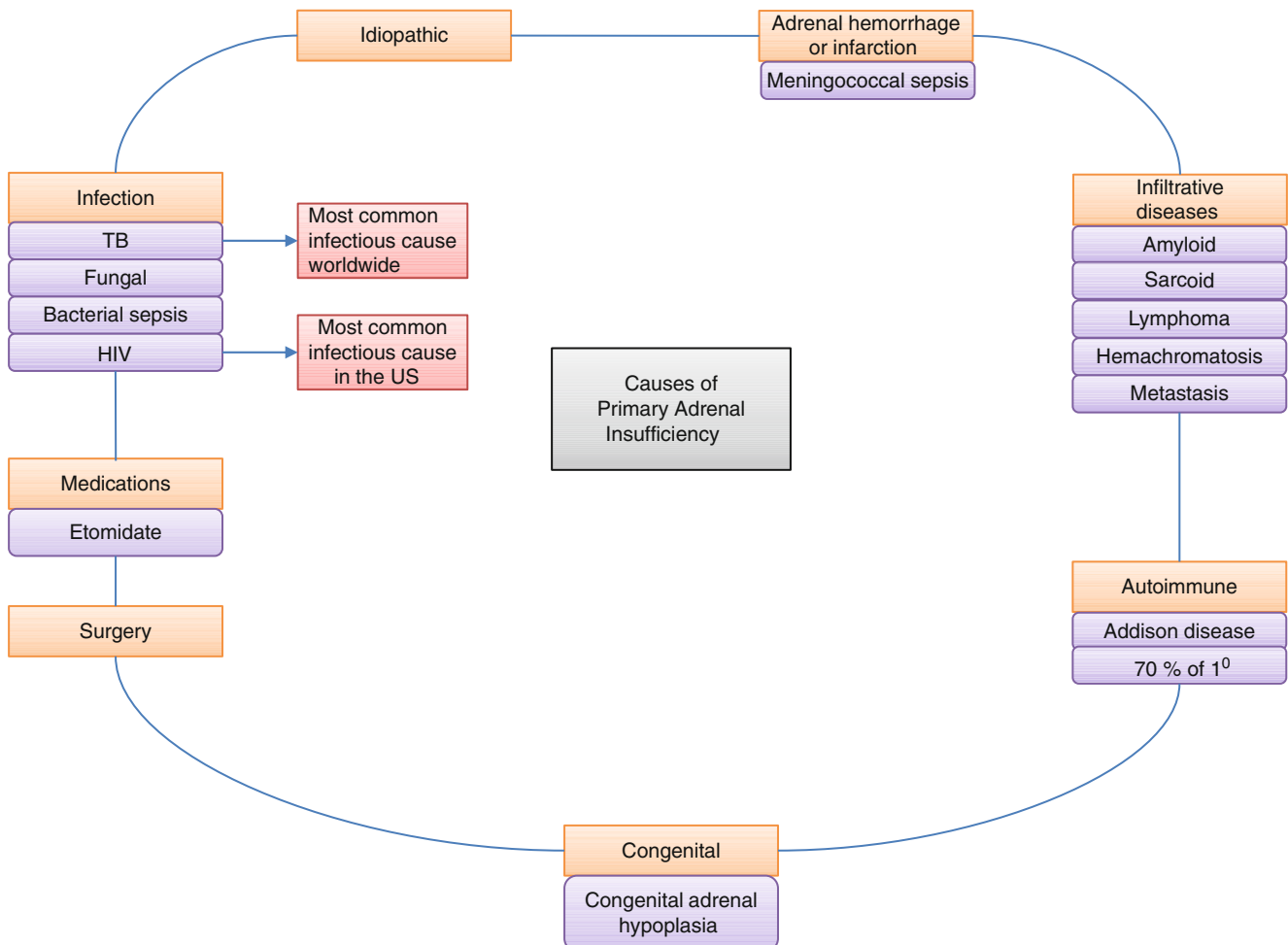
Adrenal Hormones



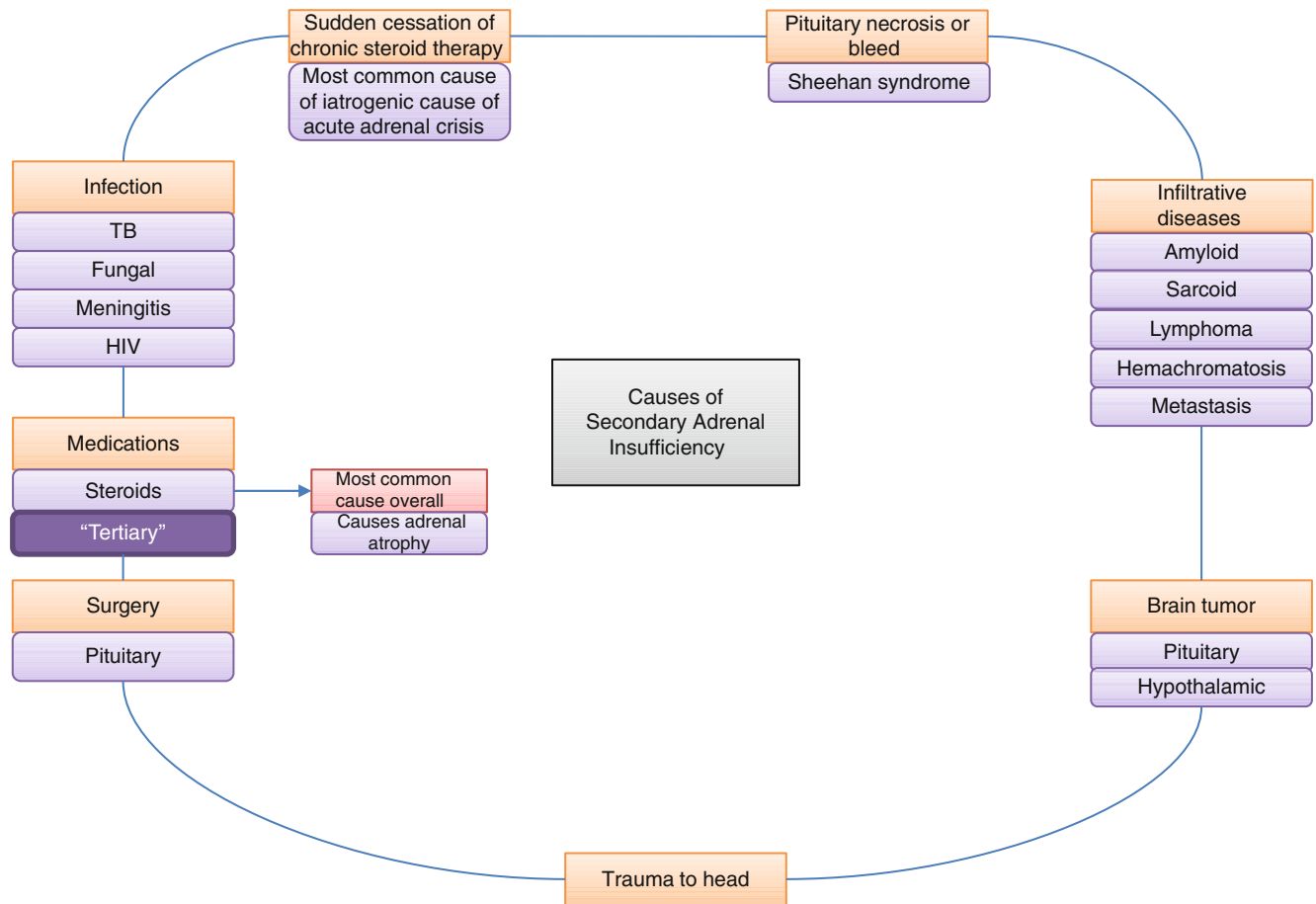
Introduction: Adrenal Insufficiency and Crisis



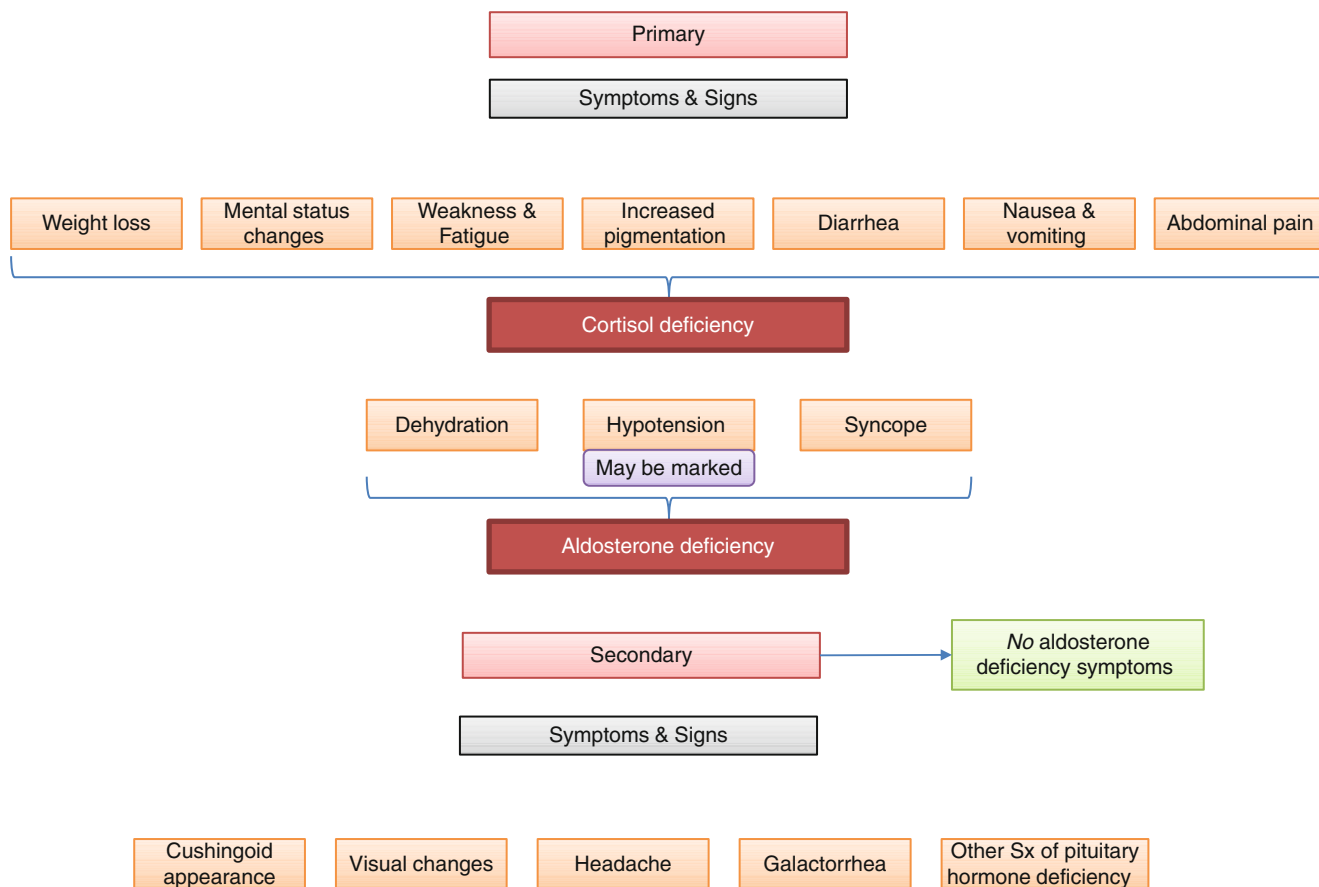
Some Causes of Primary Adrenal Insufficiency



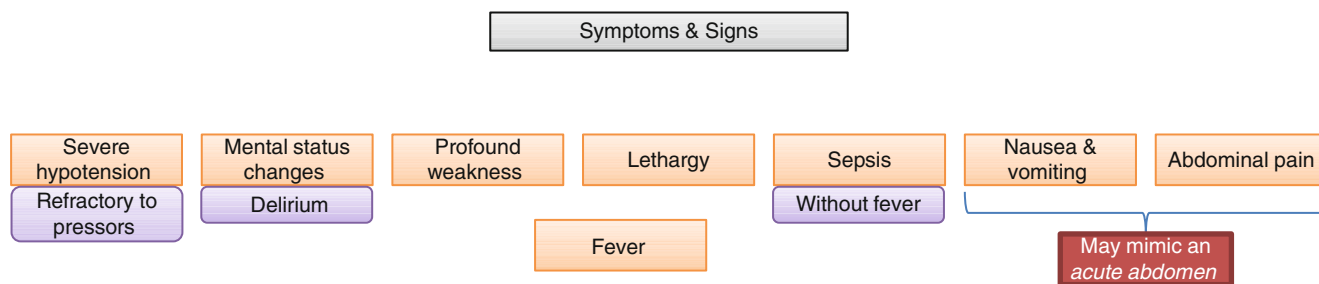
Some Causes of Secondary Adrenal Insufficiency



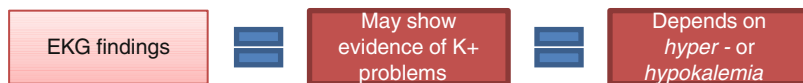
Adrenal Insufficiency: Clinical Features



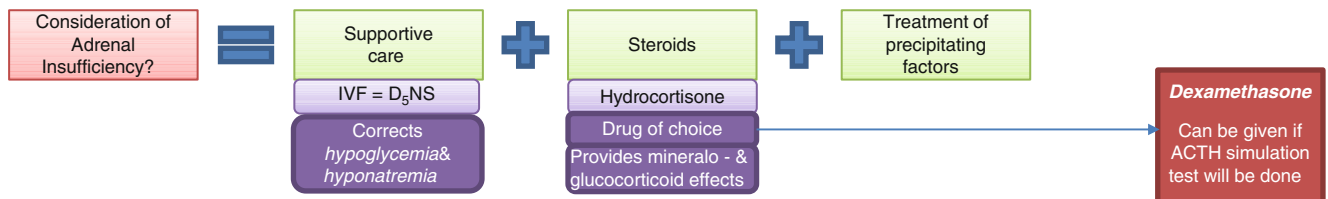
Adrenal Crisis: Clinical Features



Laboratory Abnormalities and Testing Considerations



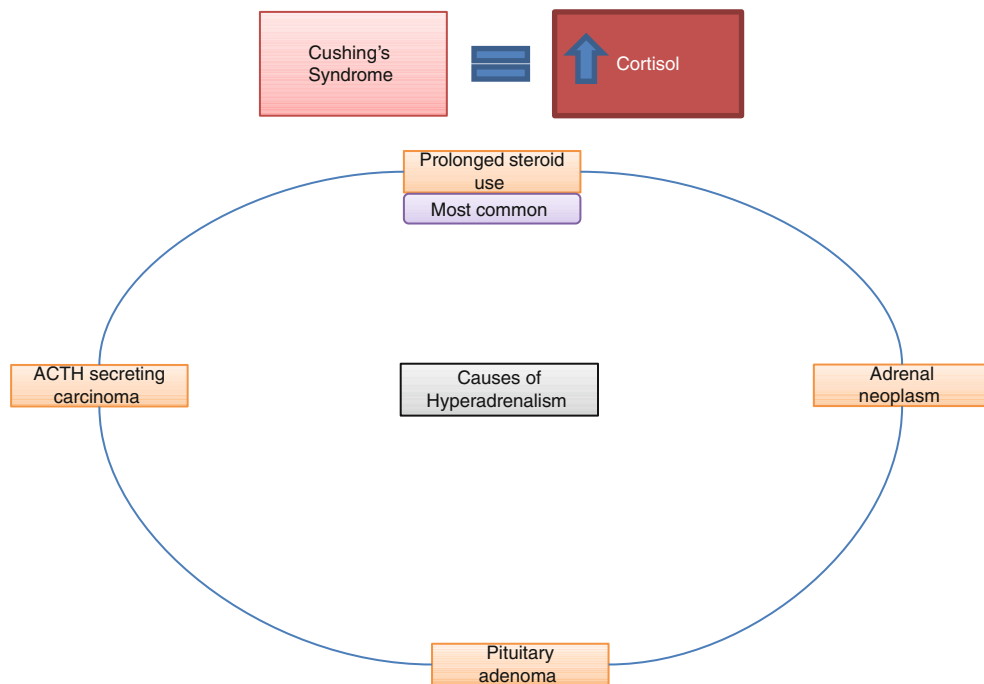
Treatment



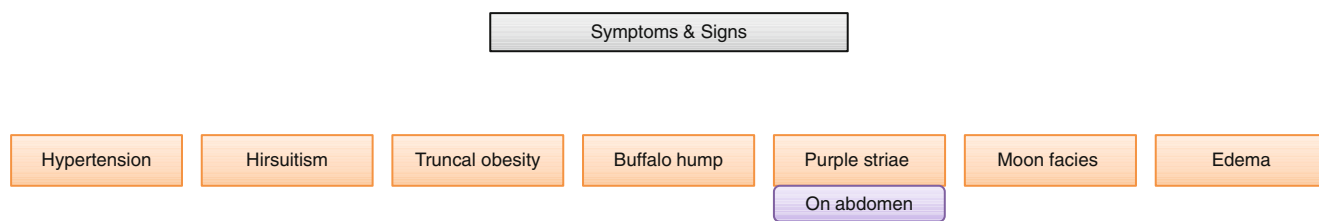
Disposition



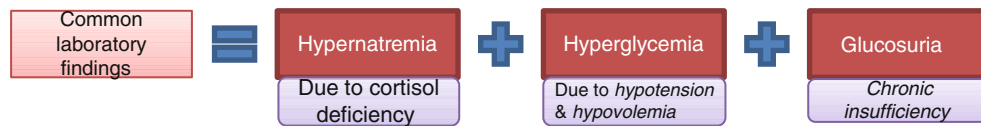
Introduction: Hyperadrenalism (Cushing's Syndrome)



Hyperadrenalism: Clinical Features



Laboratory Abnormalities and Testing Considerations



Treatment

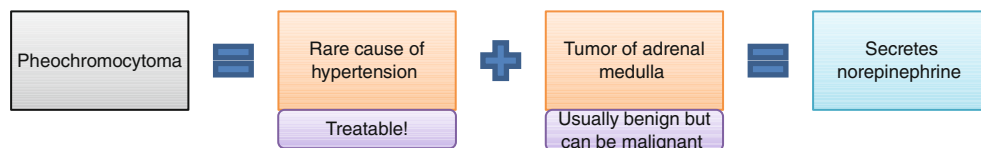


Disposition

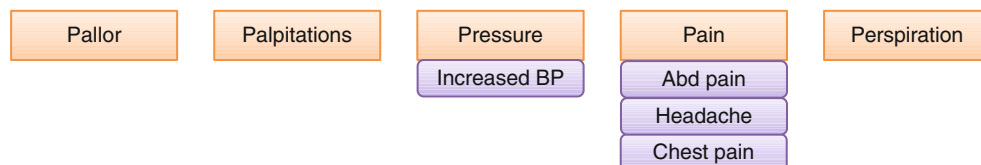
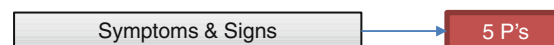


Pheochromocytoma

Introduction



Pheochromocytoma: Clinical Features



Diagnosis

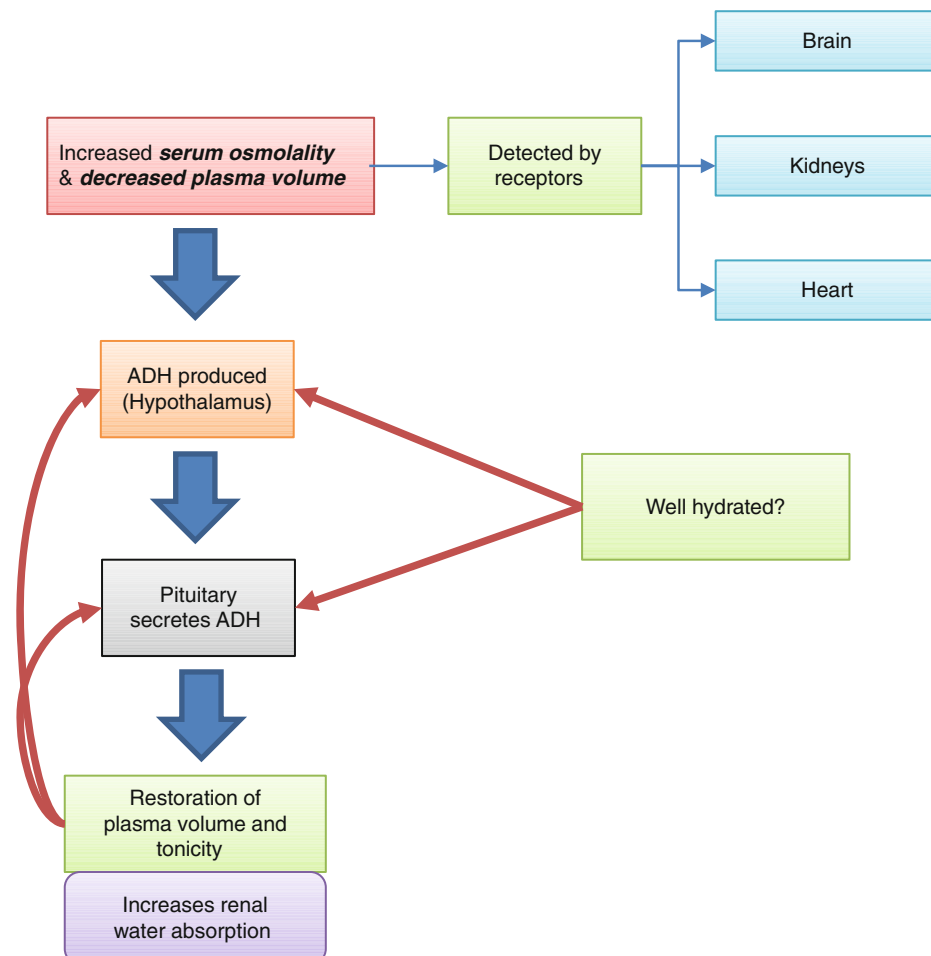


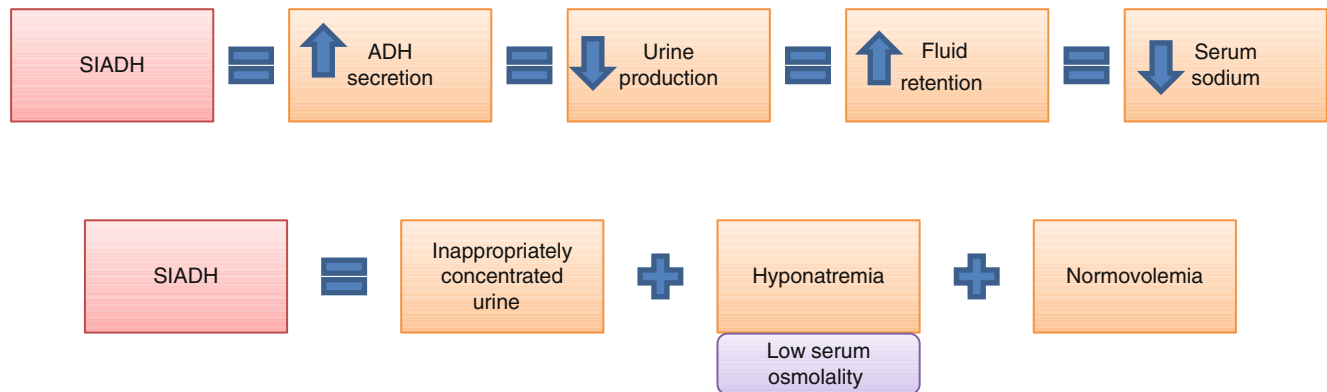
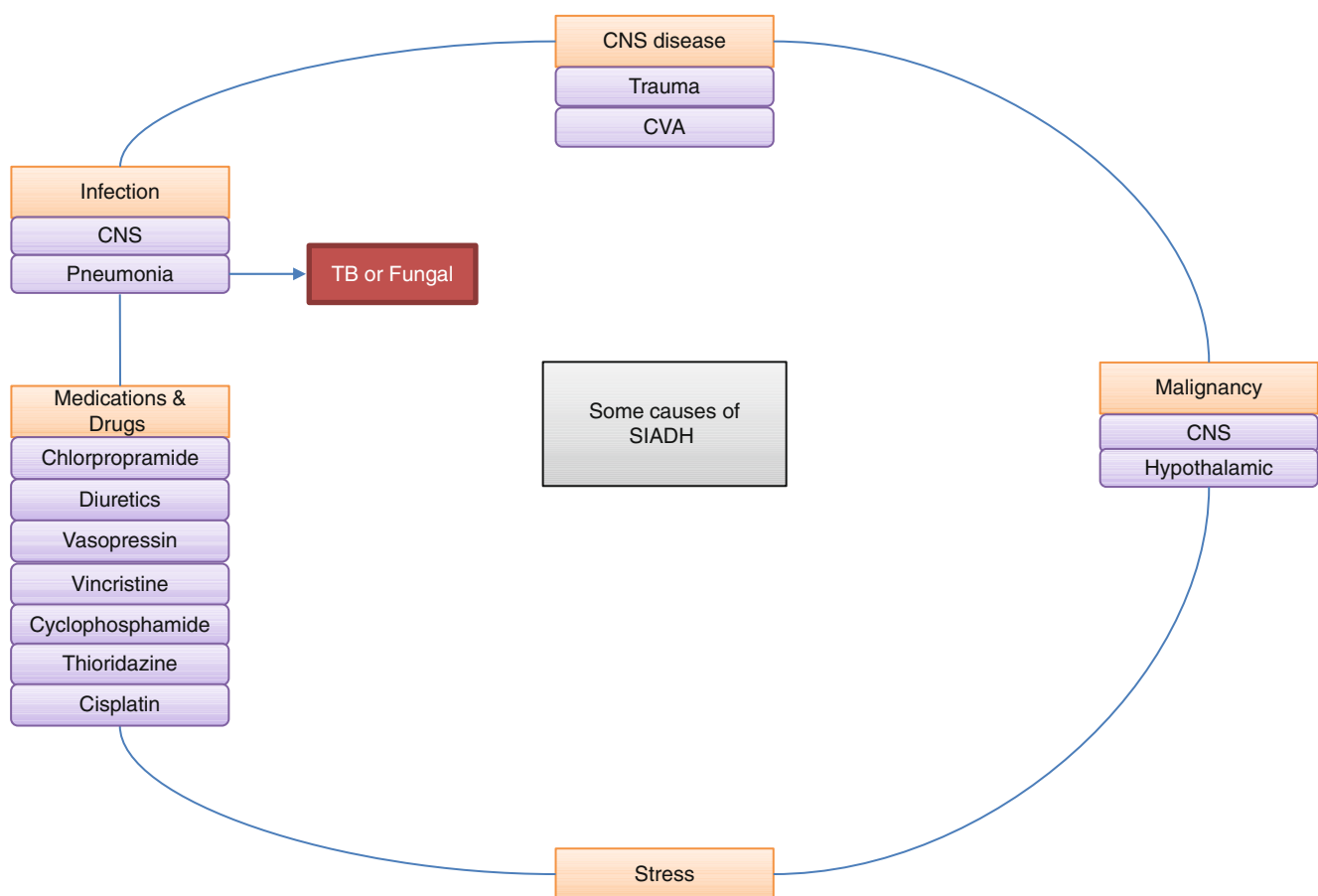
Treatment and Disposition



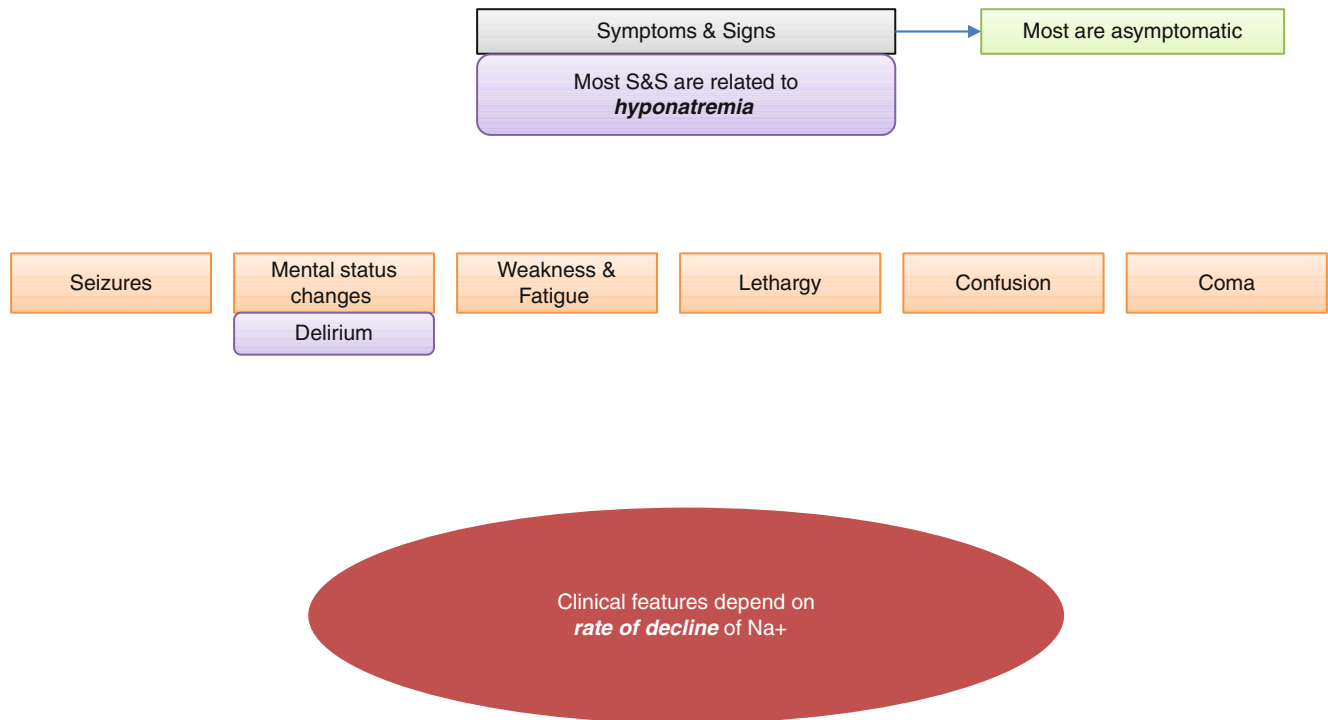
ADH-Related Diseases

Antidiuretic Hormone

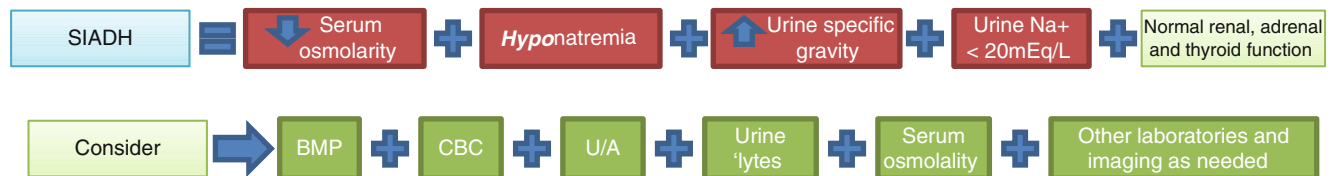


Introduction: Syndrome of Inappropriate Antidiuretic Hormone Secretion (SIADH)**Some Causes of SIADH**

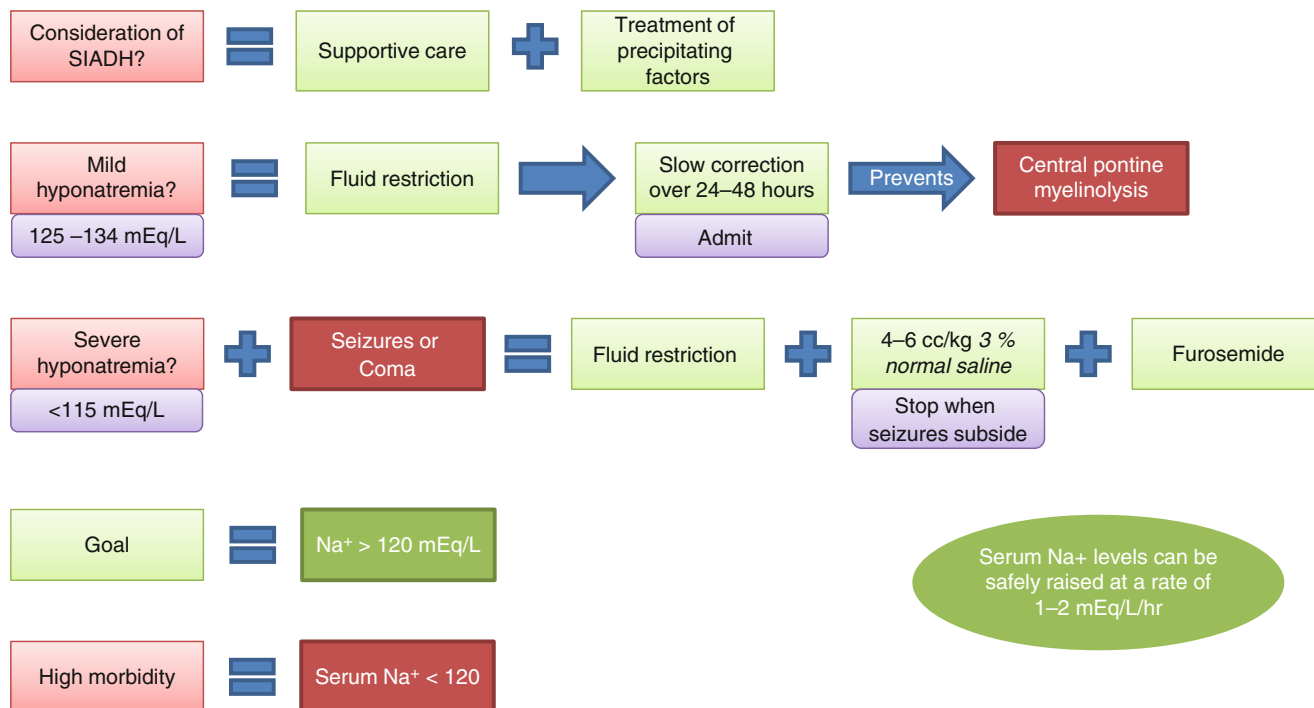
SIADH: Clinical Features



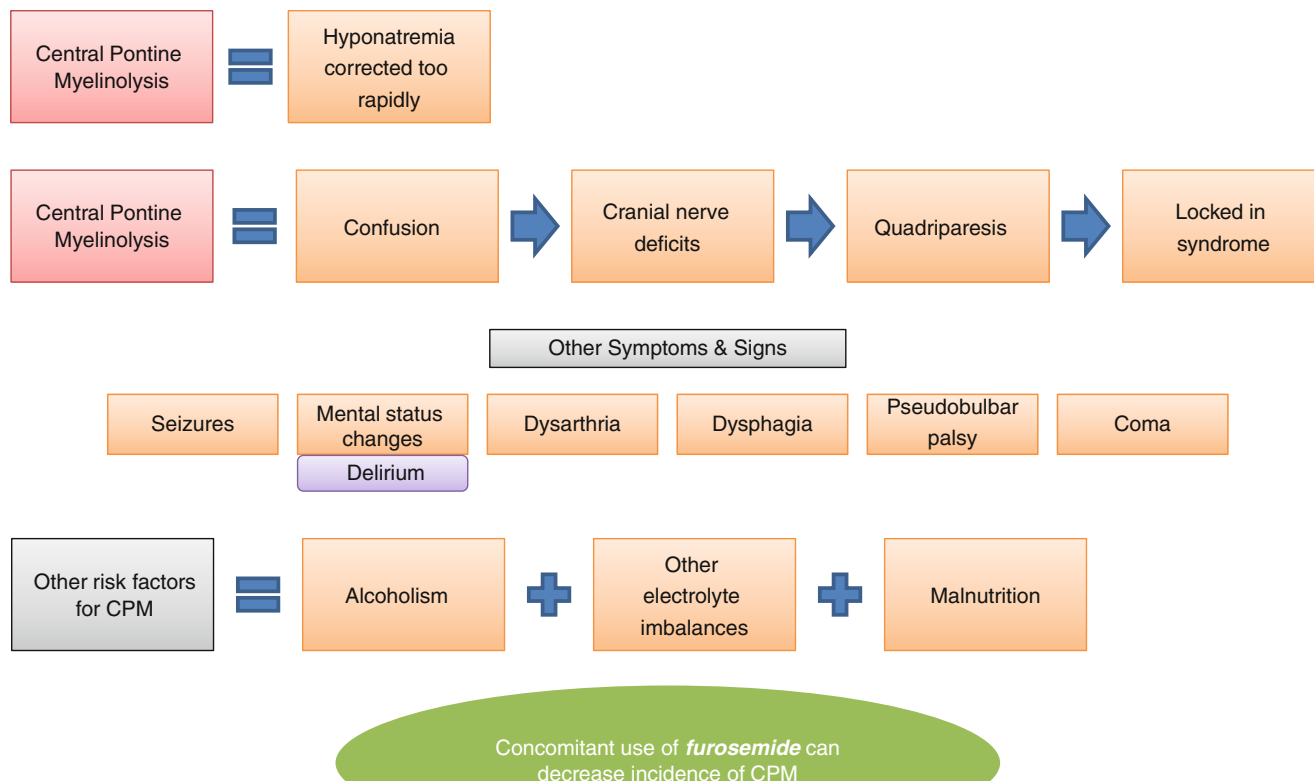
Laboratory Abnormalities and Testing Considerations



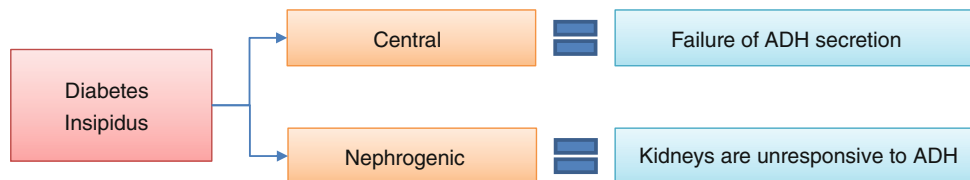
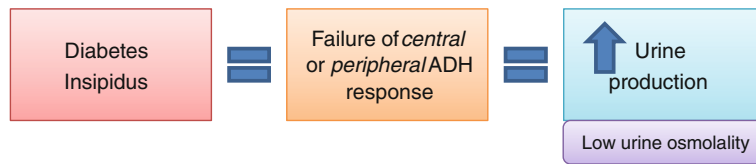
Treatment and Disposition



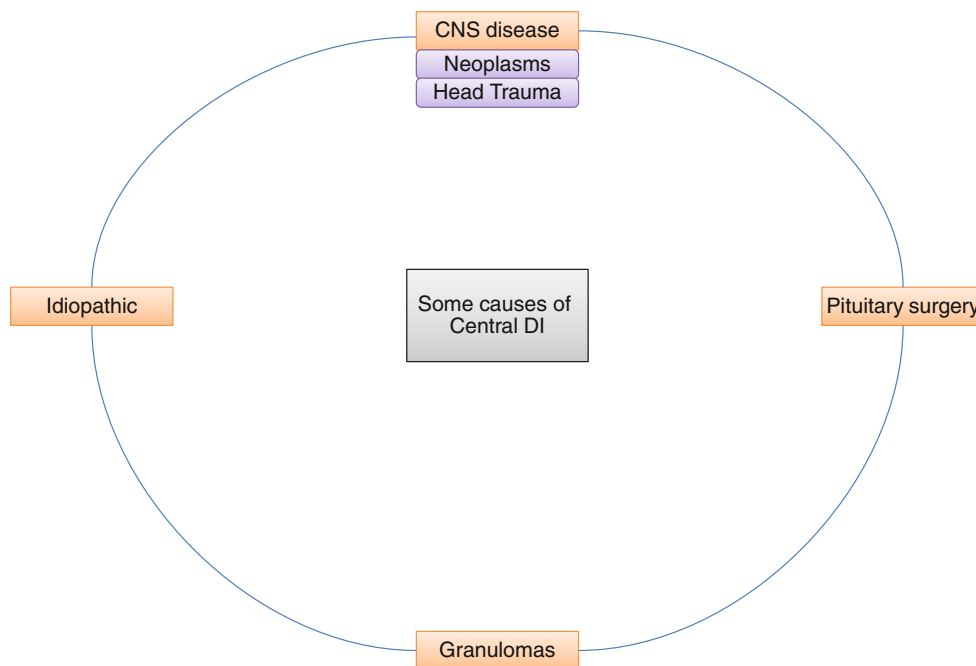
Central Pontine Myelinolysis



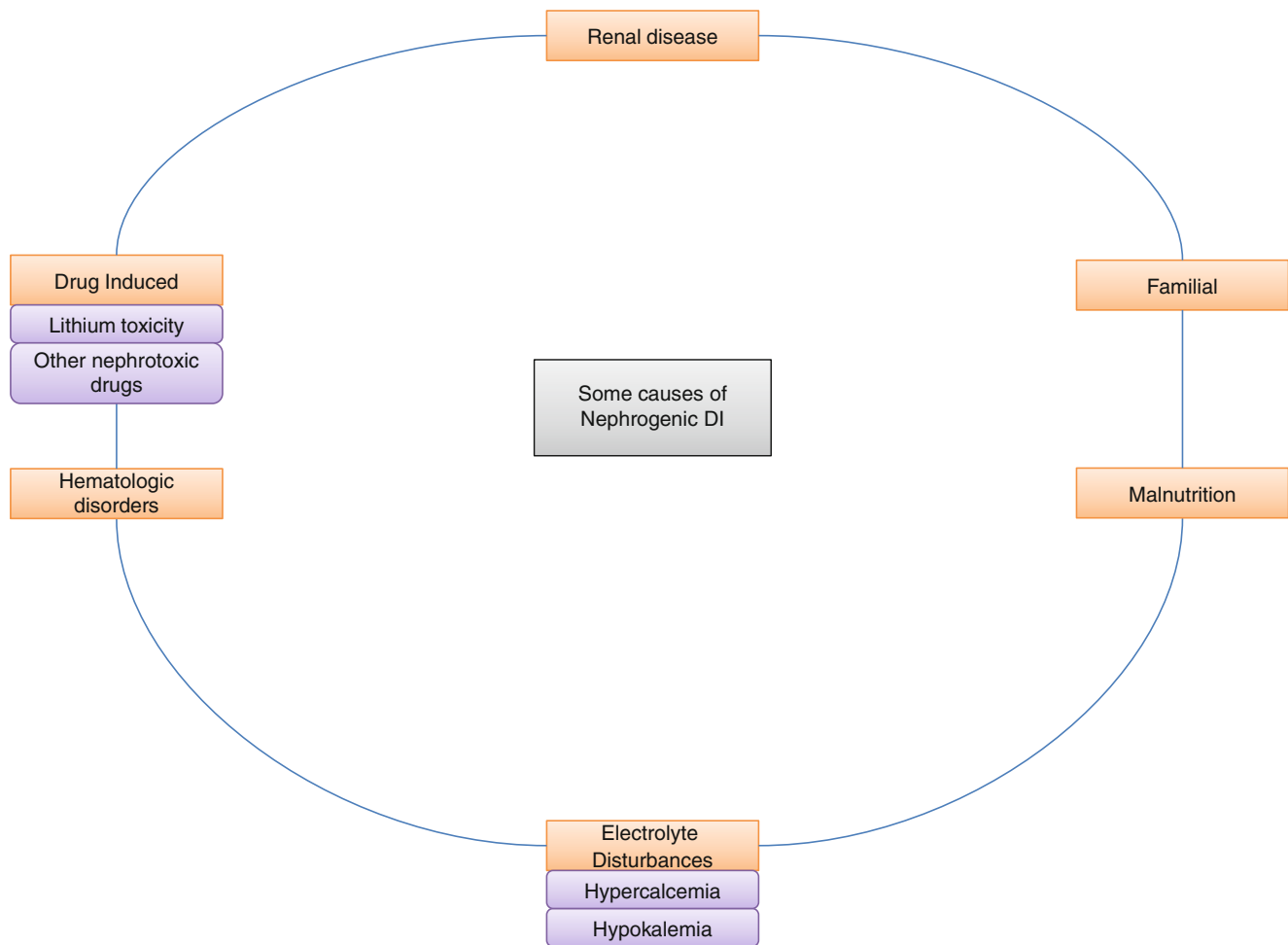
Introduction: Diabetes Insipidus



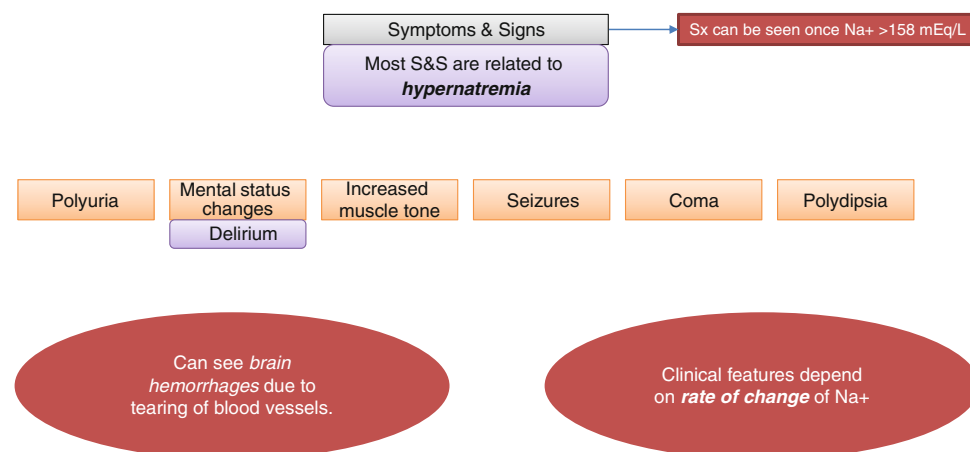
Some Causes of Central DI



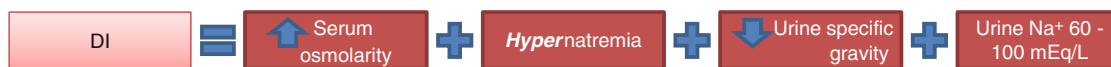
Some Causes of Nephrogenic DI



DI: Clinical Features

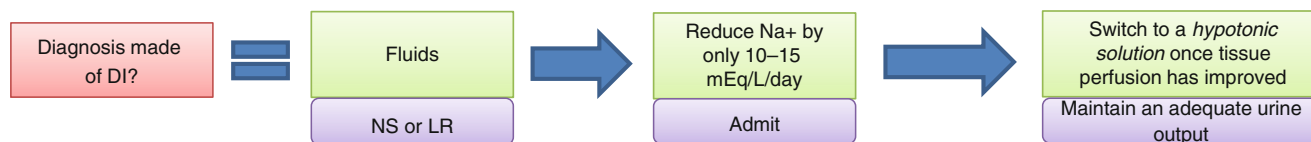
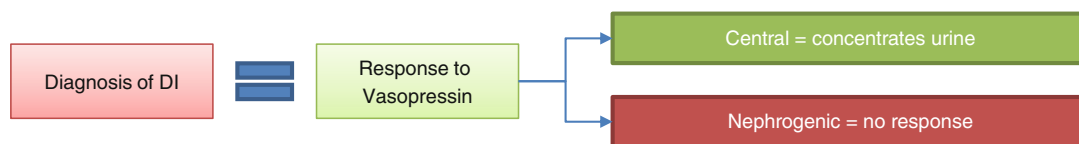


Laboratory Abnormalities and Testing Considerations



Hypocalcemia is frequently seen in patients with hypernatremia

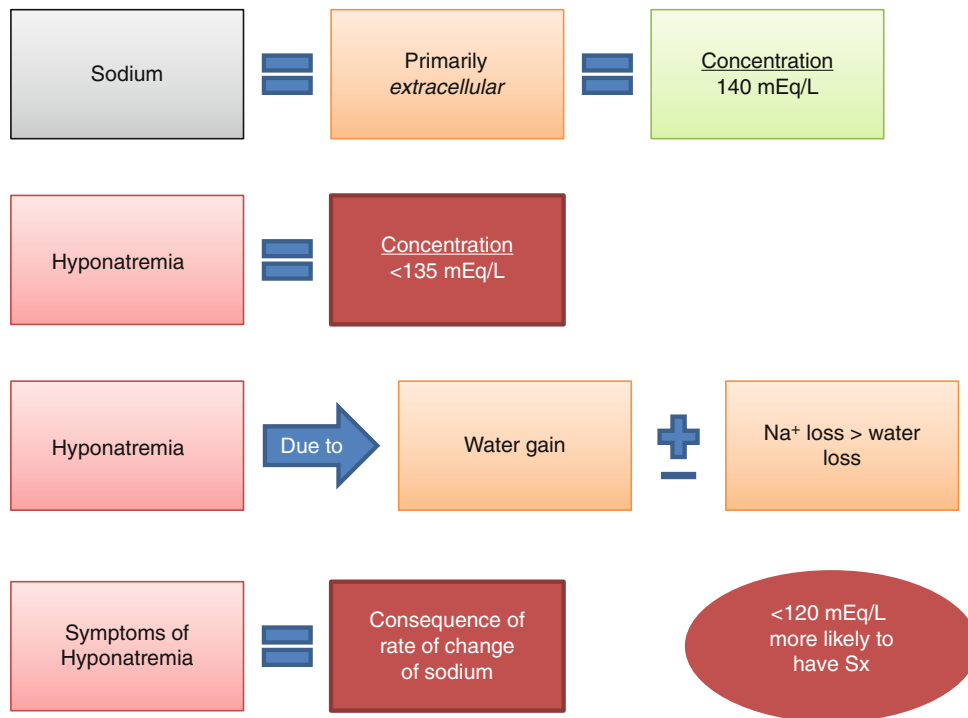
Treatment and Disposition



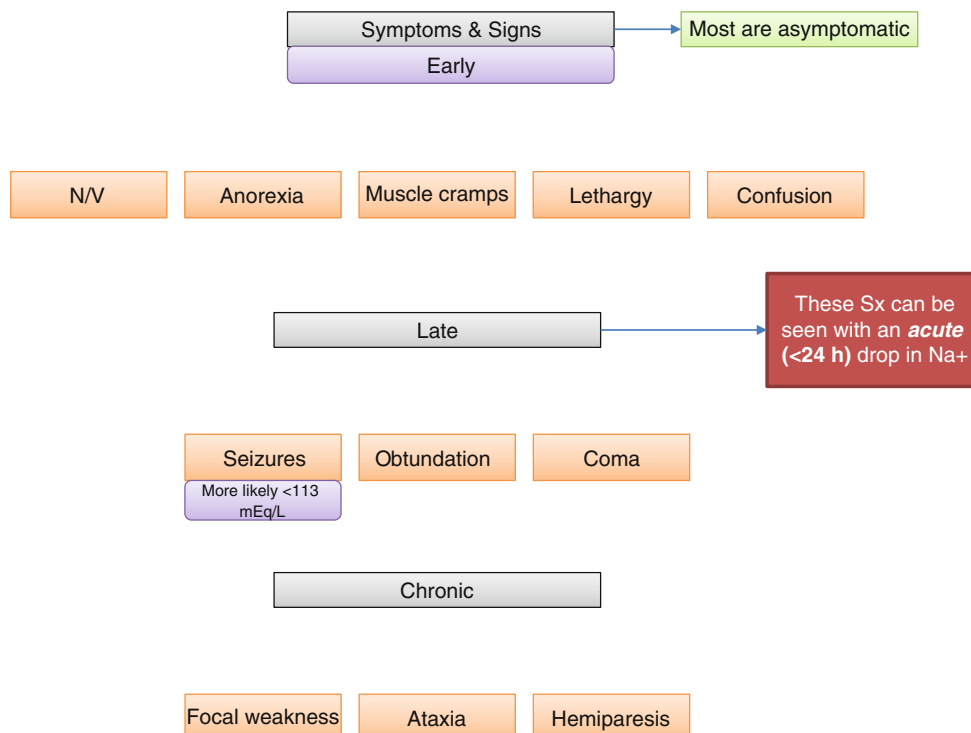
Electrolytes and Acid-Base

Sodium

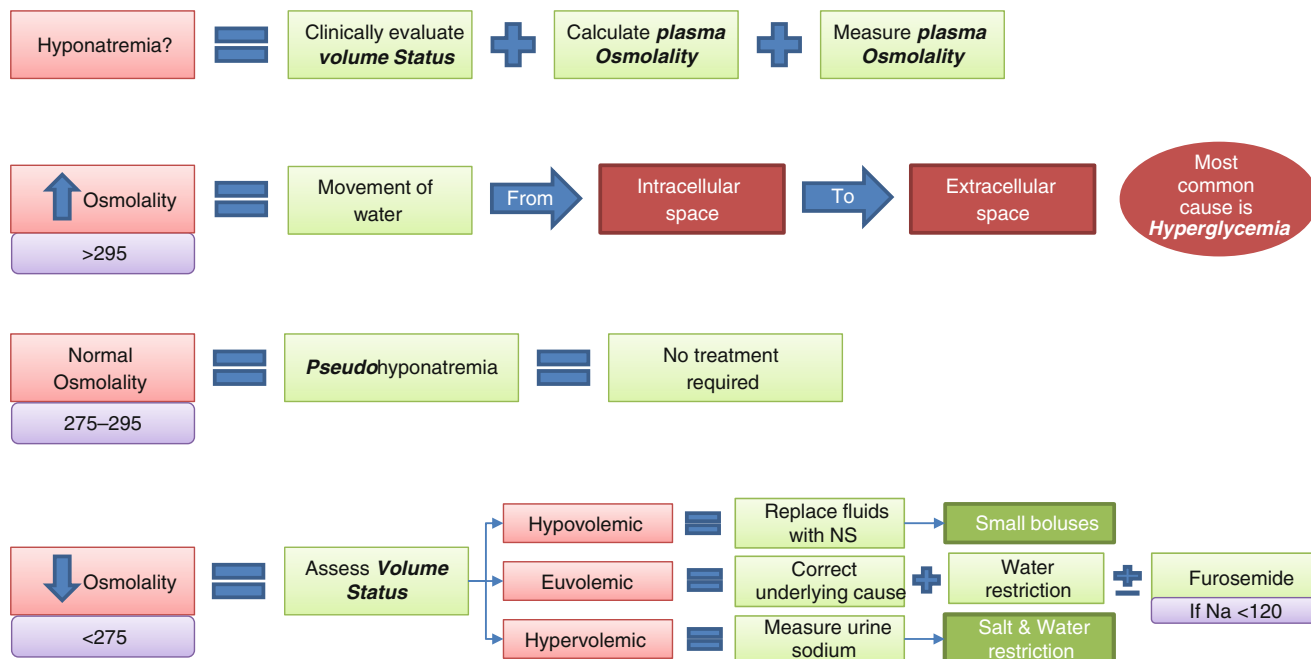
Introduction: Hyponatremia



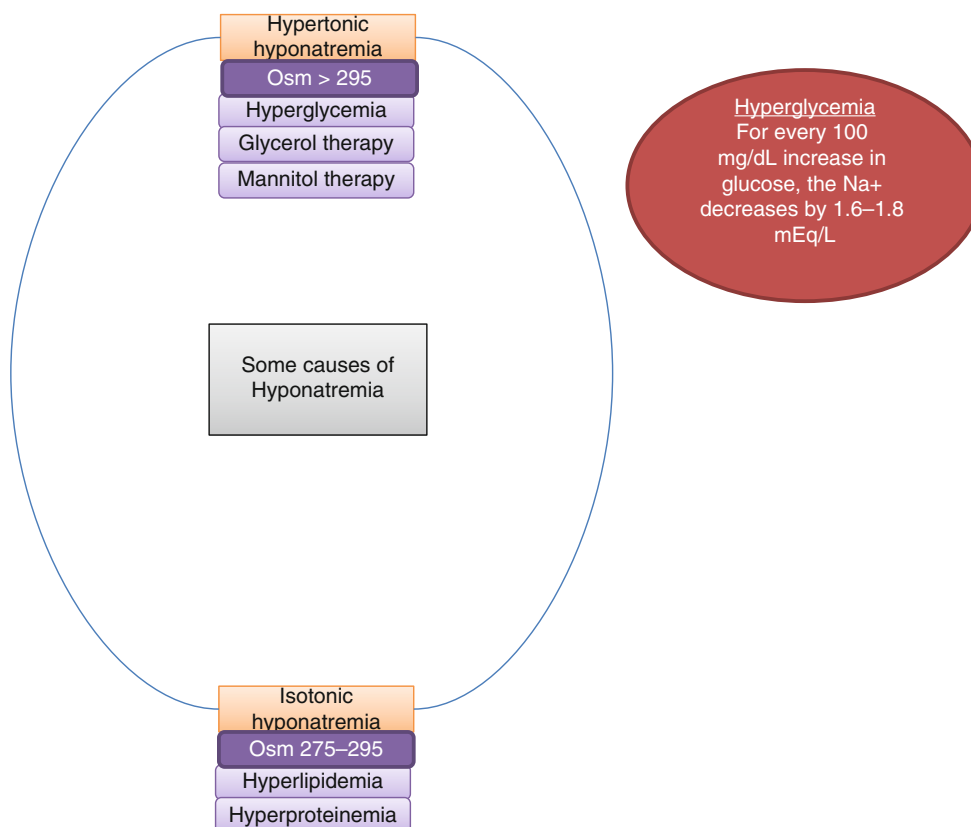
Hyponatremia



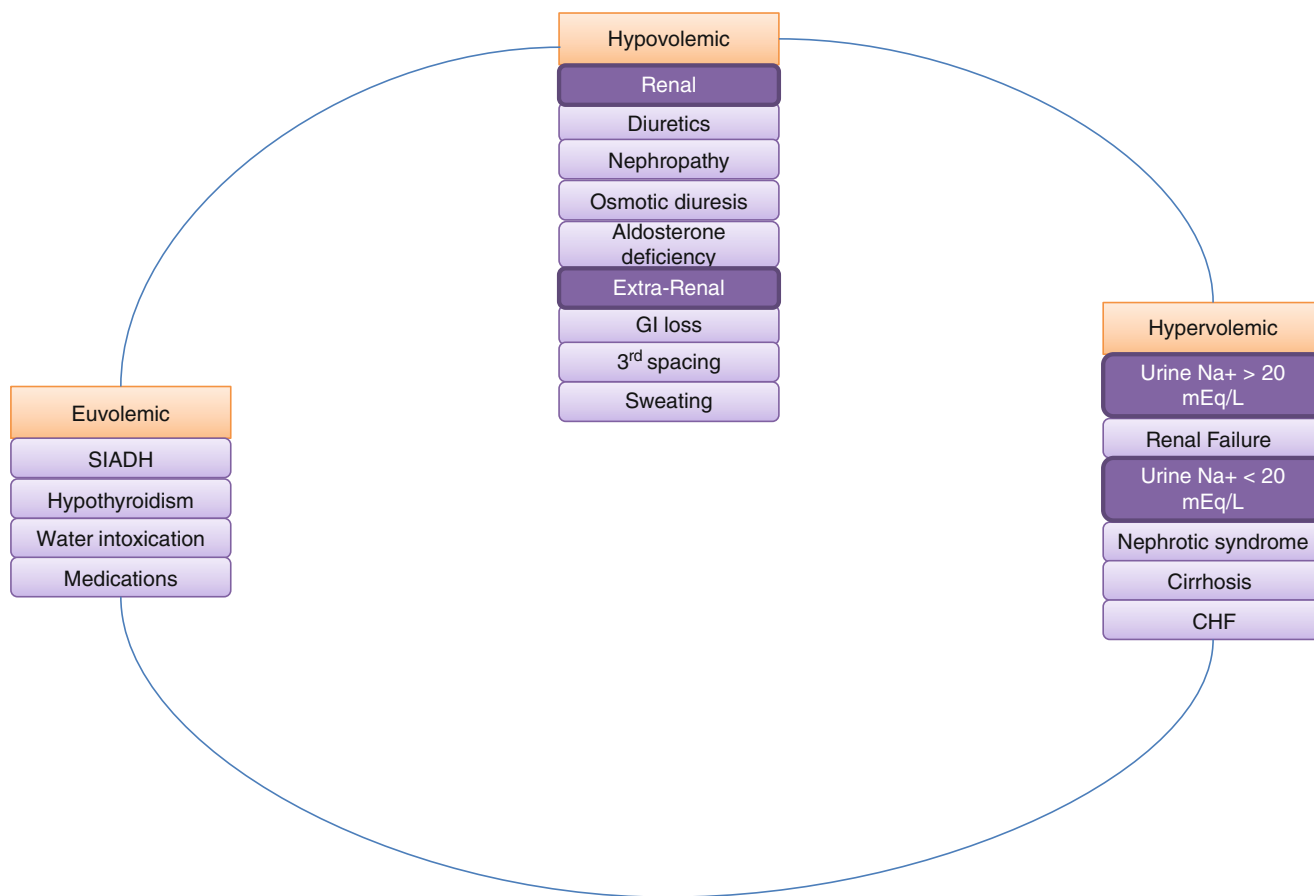
Diagnosis + Treatment



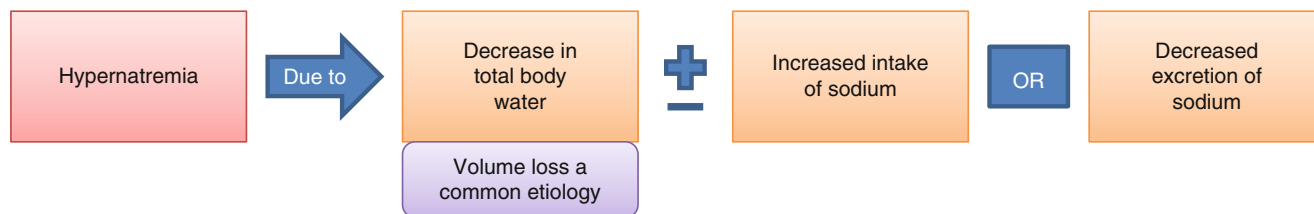
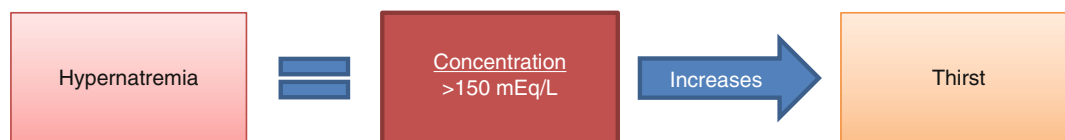
Causes of Hyponatremia



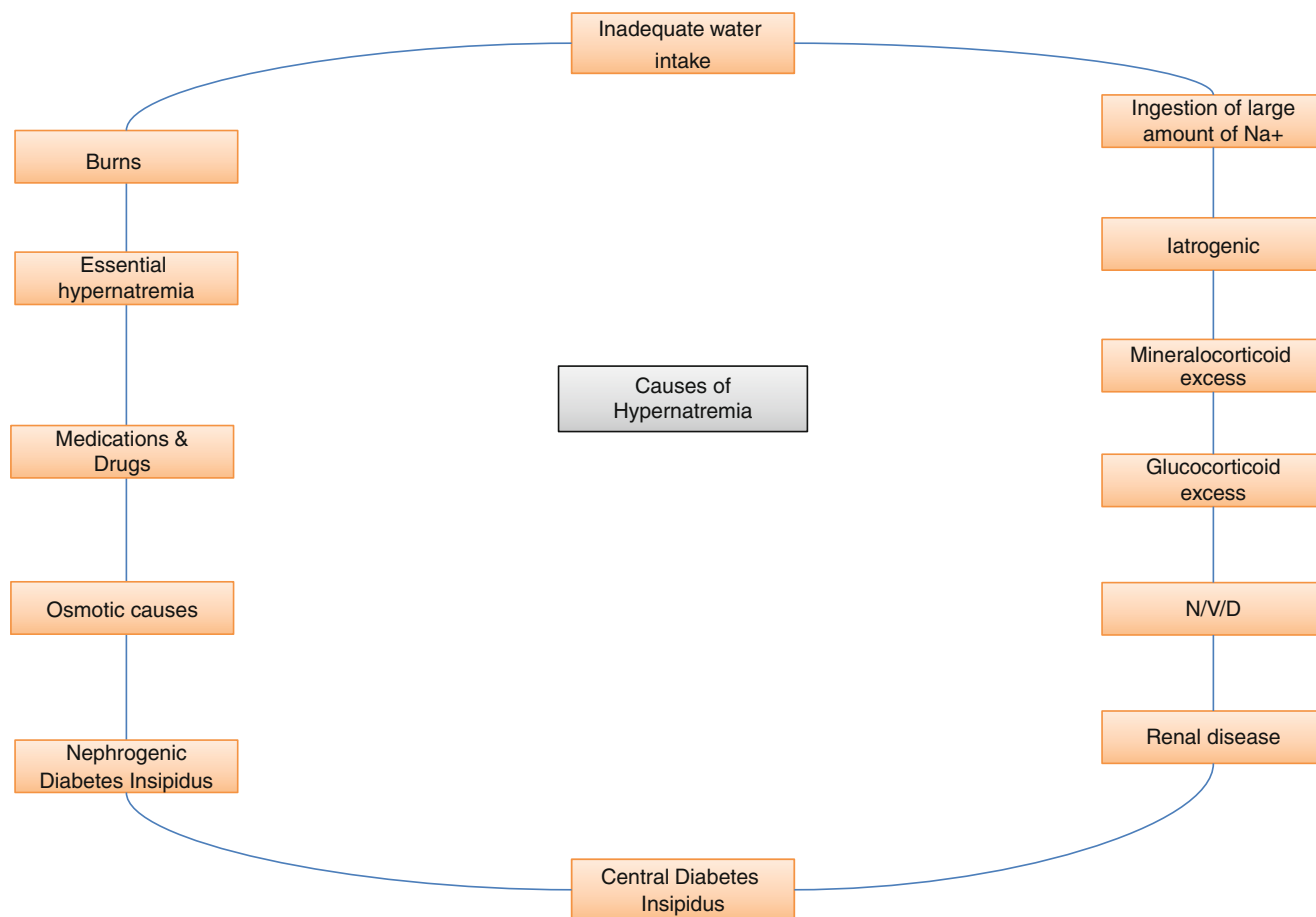
Causes of Hypotonic Hyponatremia (Osm < 275)



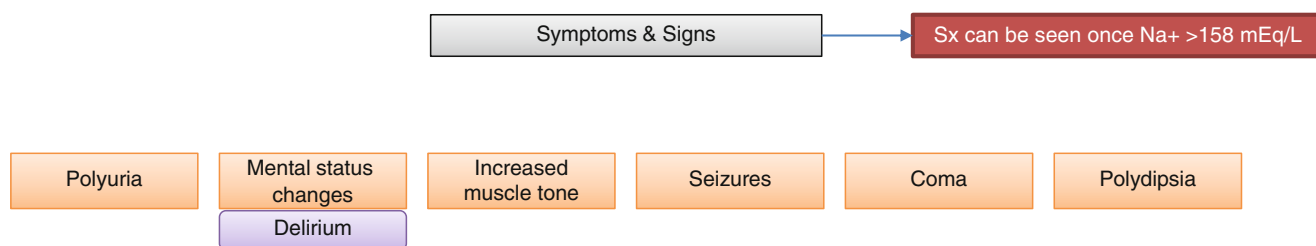
Introduction: Hypernatremia



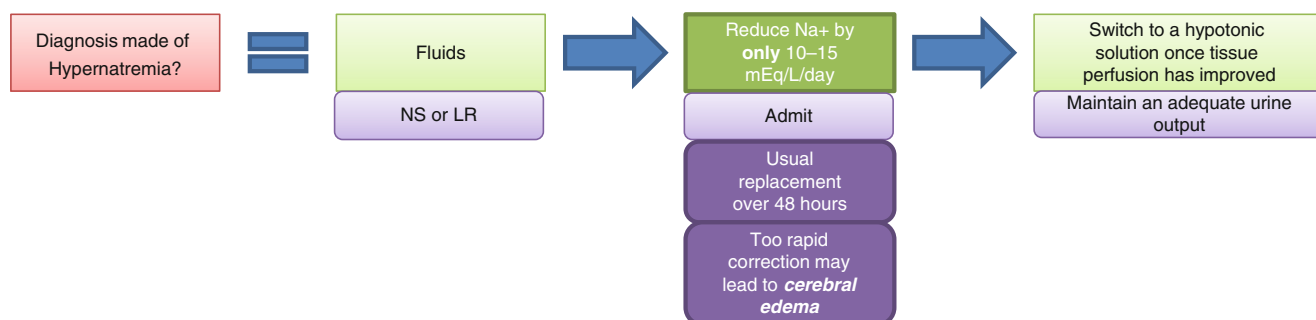
Some Causes of Hypernatremia



Hypernatremia Symptoms

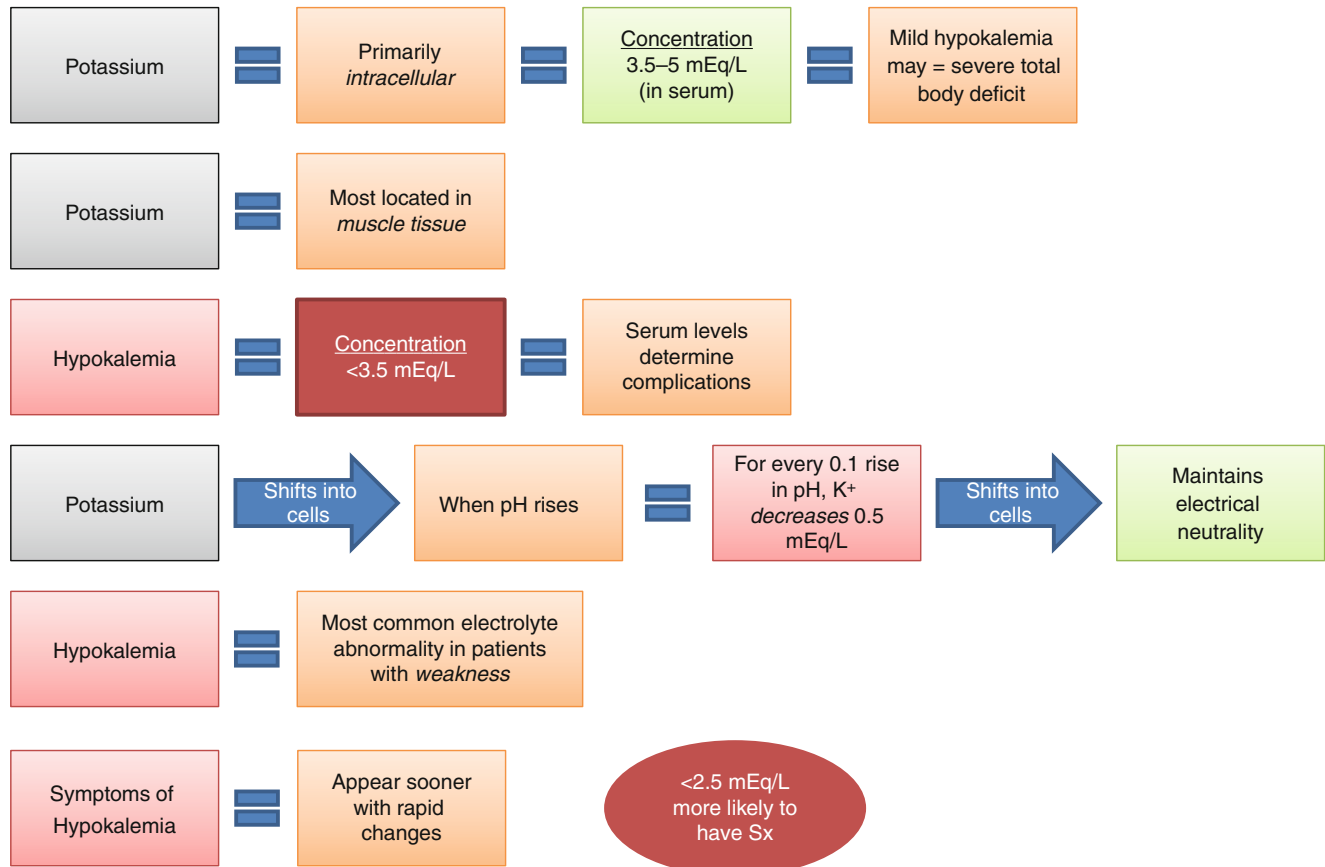


Treatment

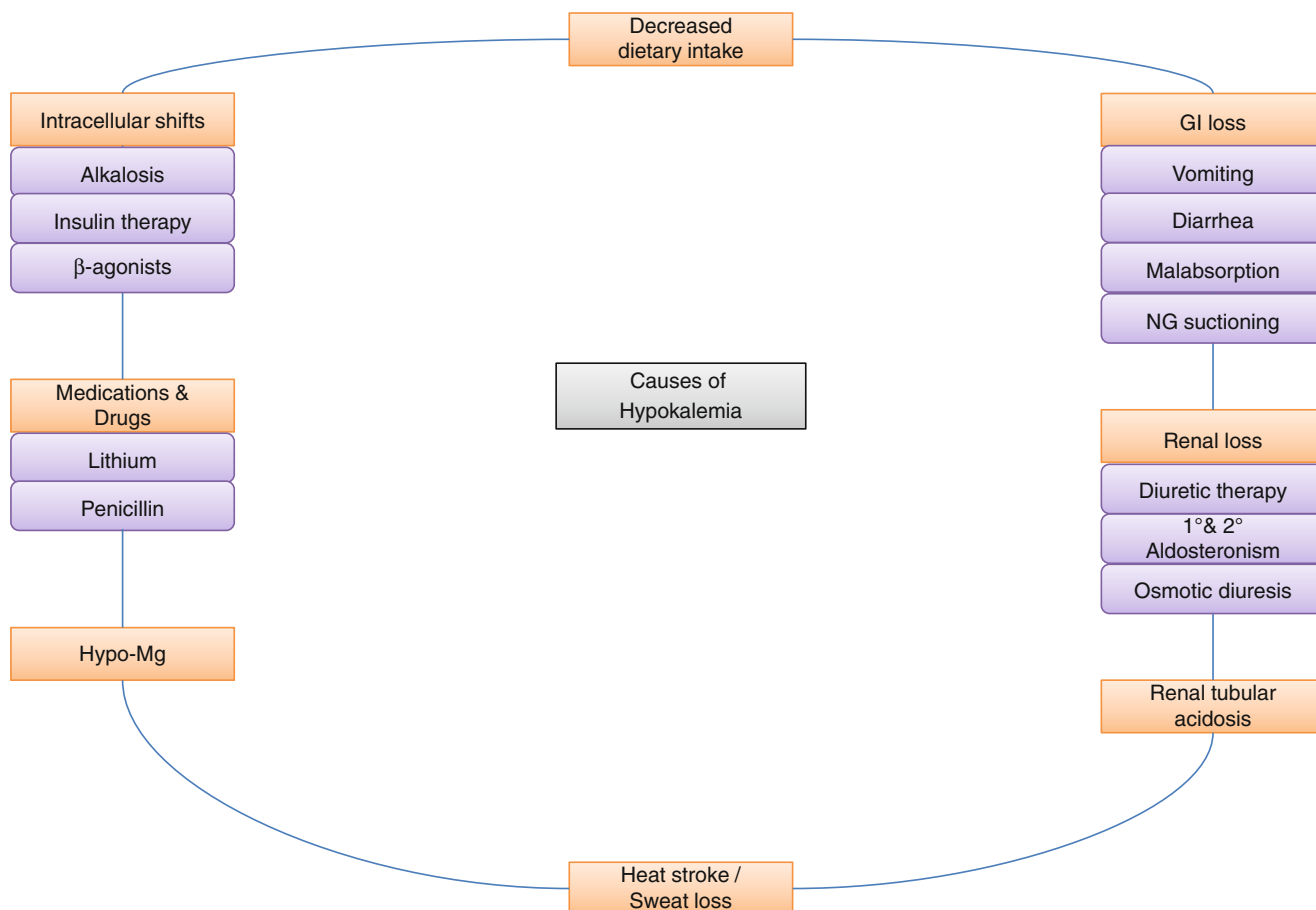


Potassium

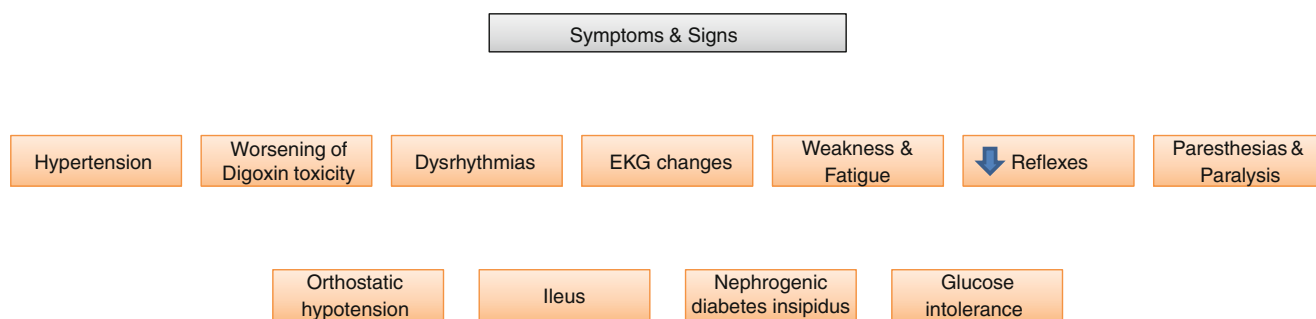
Introduction: Hypokalemia



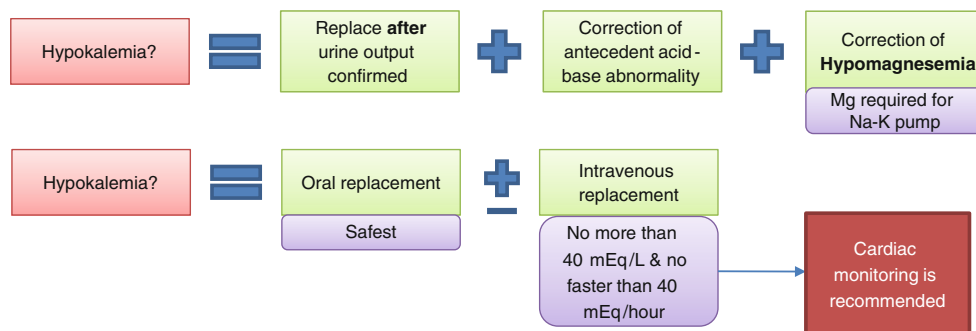
Causes of Hypokalemia



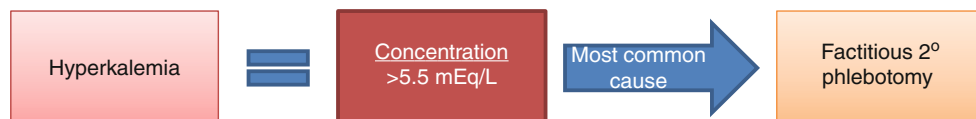
Hypokalemia Symptoms and Signs



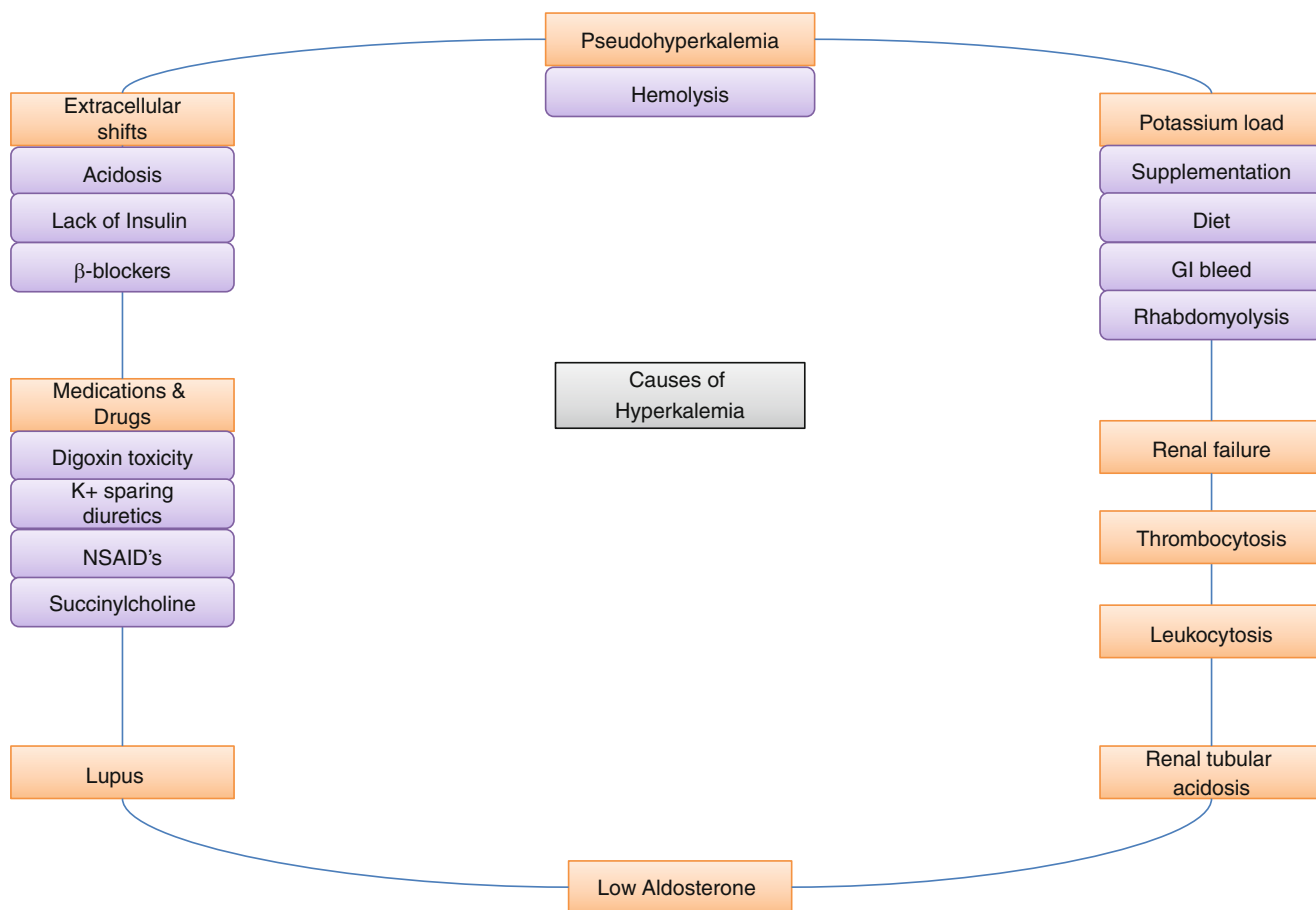
Diagnosis + Treatment



Introduction: Hyperkalemia



Causes of Hyperkalemia

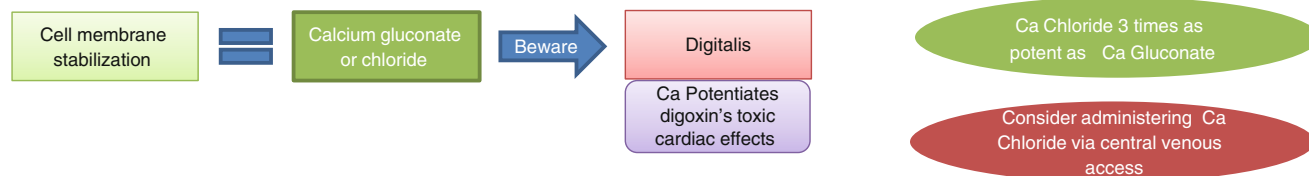
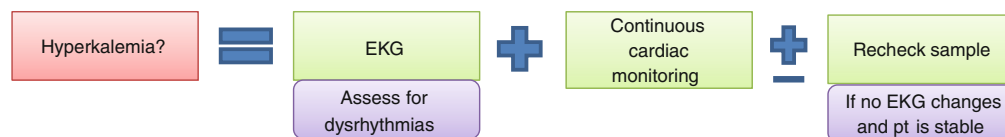


Hyperkalemia Symptoms and Signs

Symptoms & Signs

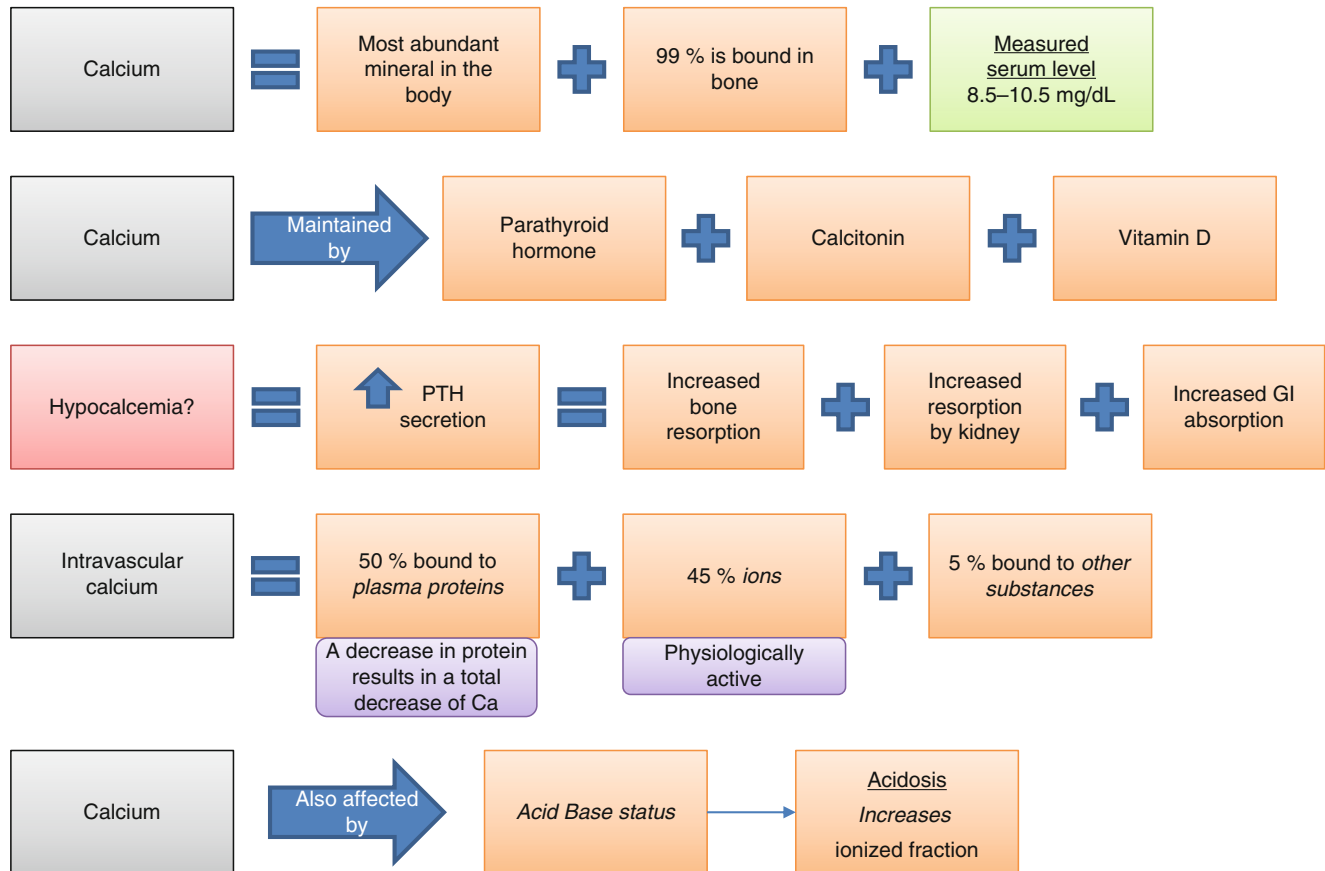
Cardiac dysrhythmias	EKG changes	N/V/D	Ascending paralysis	Weakness & fatigue	Areflexia	Paresthesias & Paralysis
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Diagnosis + Treatment

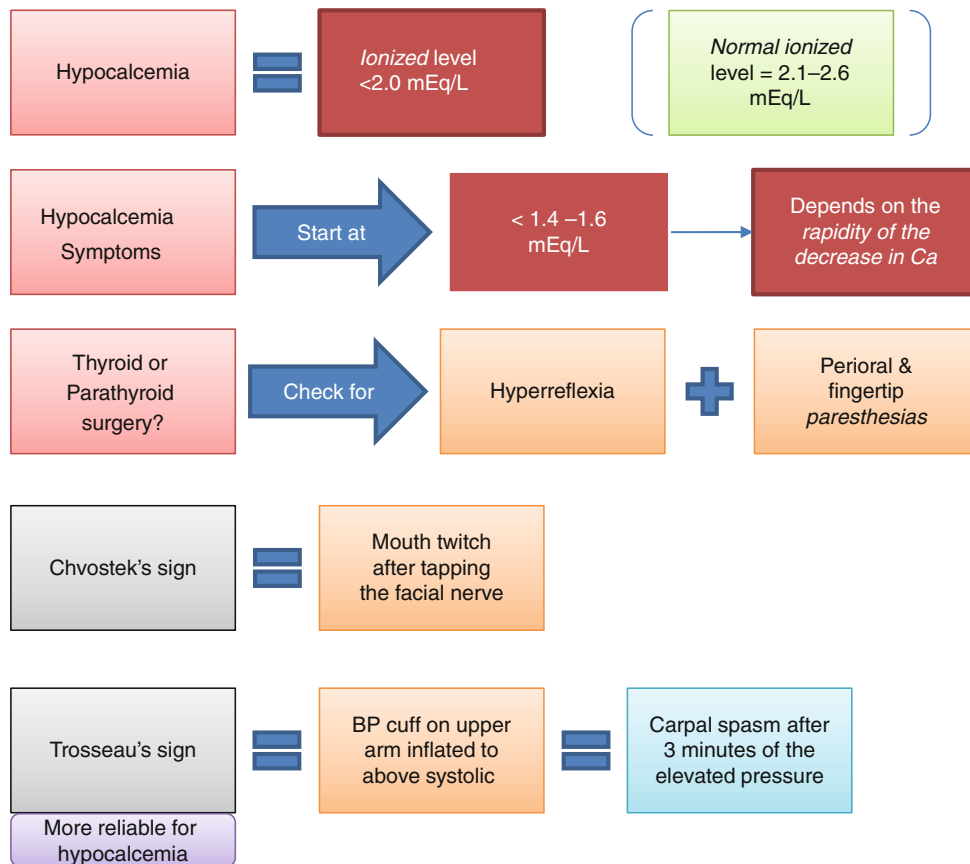


Calcium

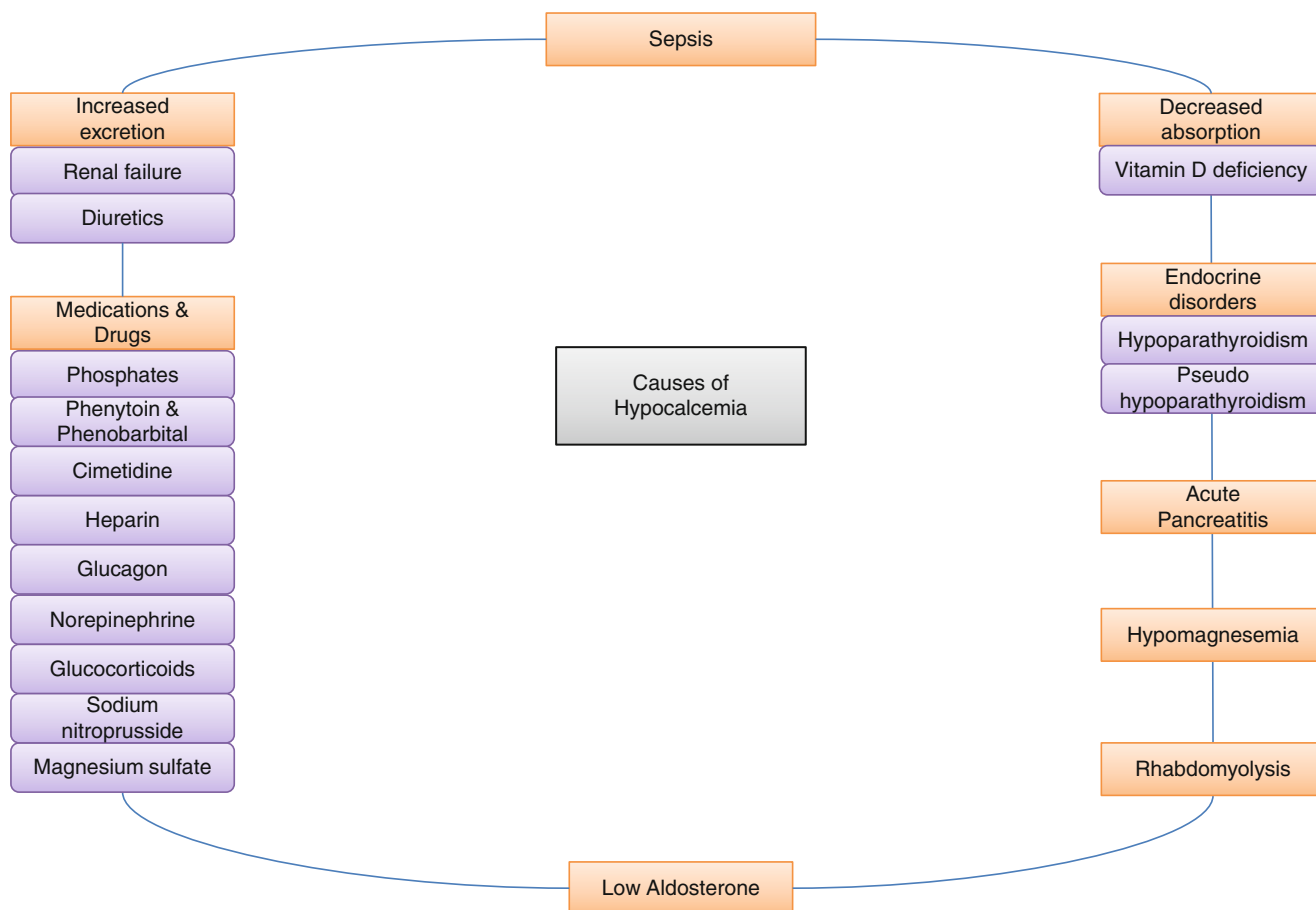
Introduction: Calcium



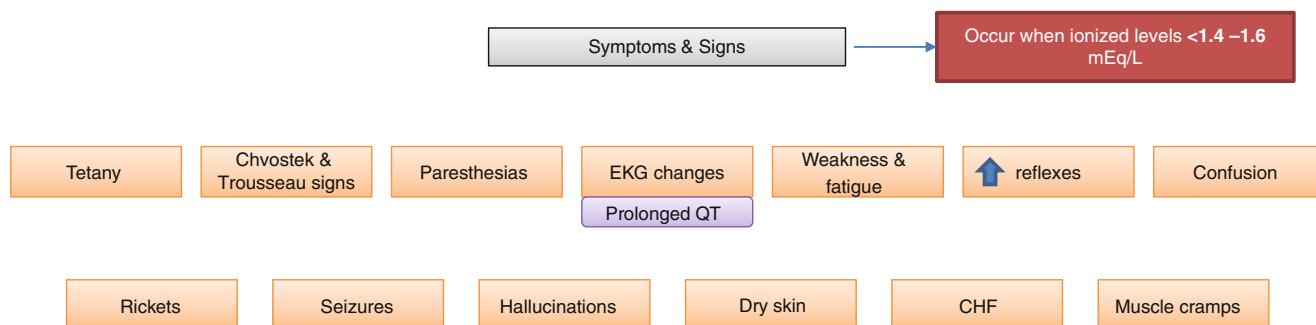
Introduction: Hypocalcemia



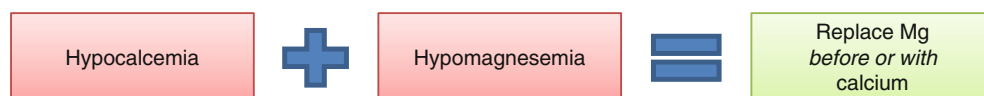
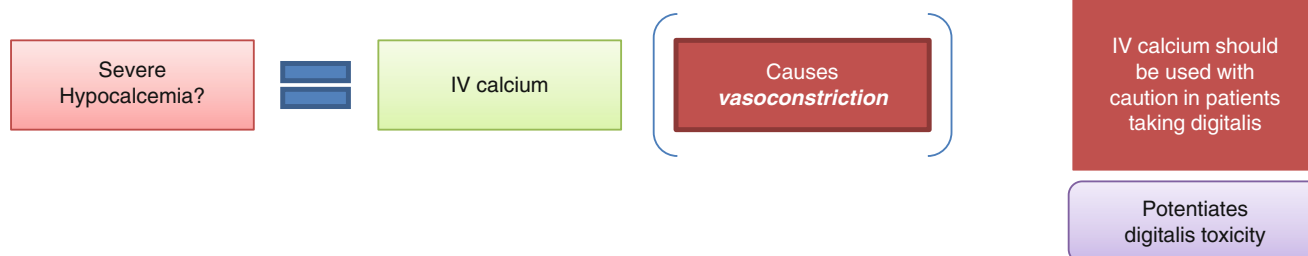
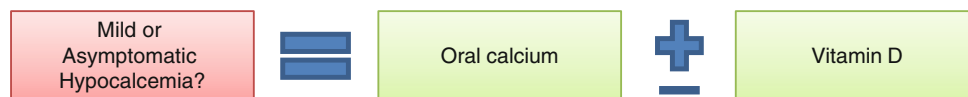
Causes of Hypocalcemia



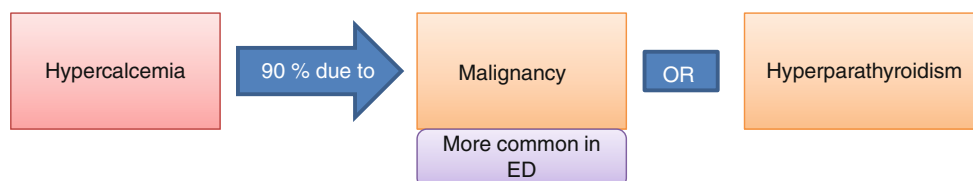
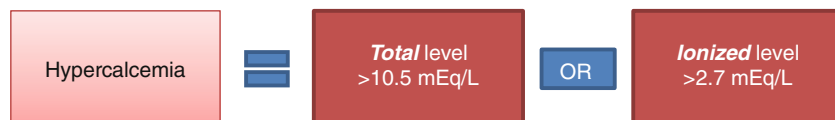
Hypocalcemia Symptoms and Signs



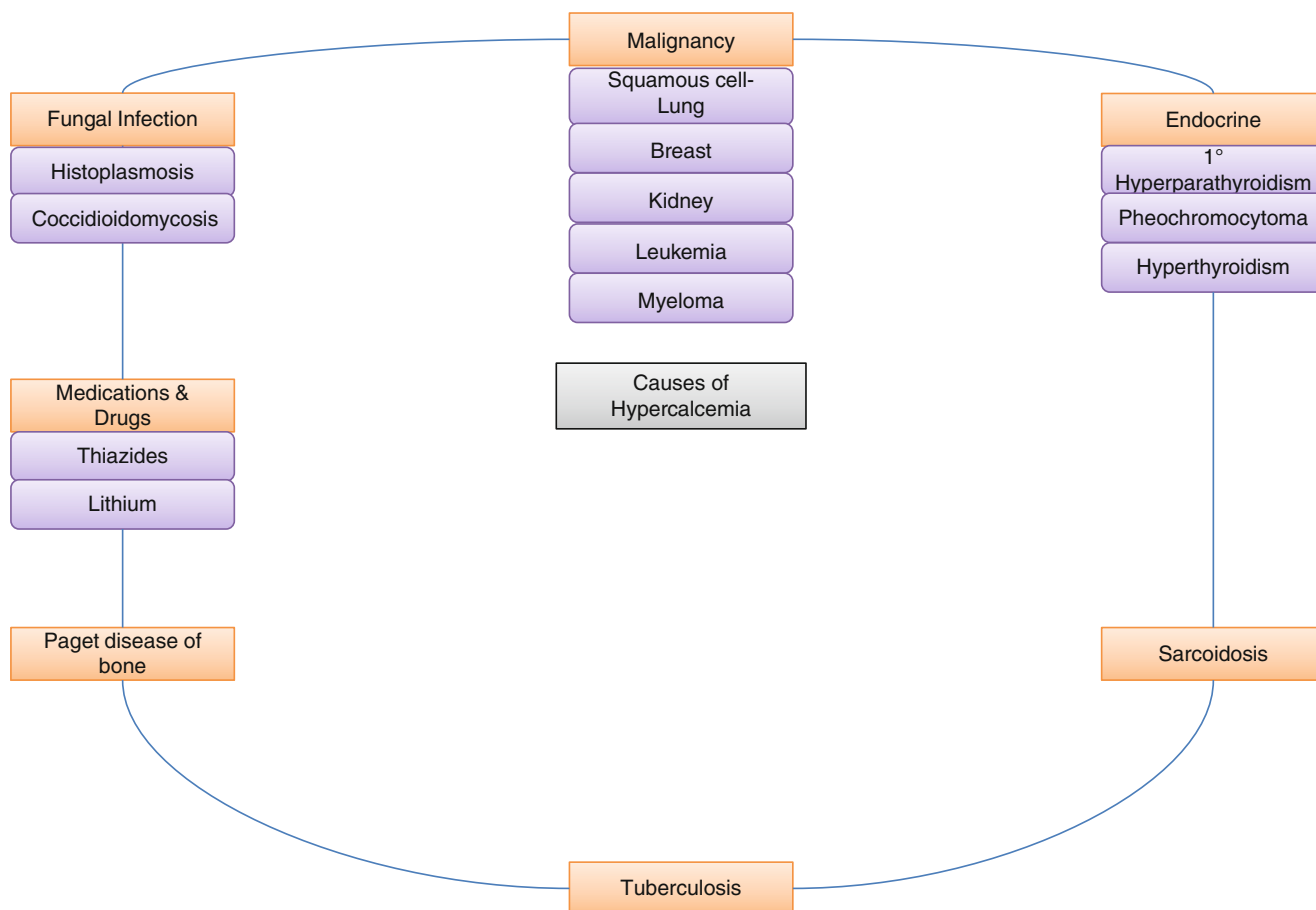
Diagnosis + Treatment



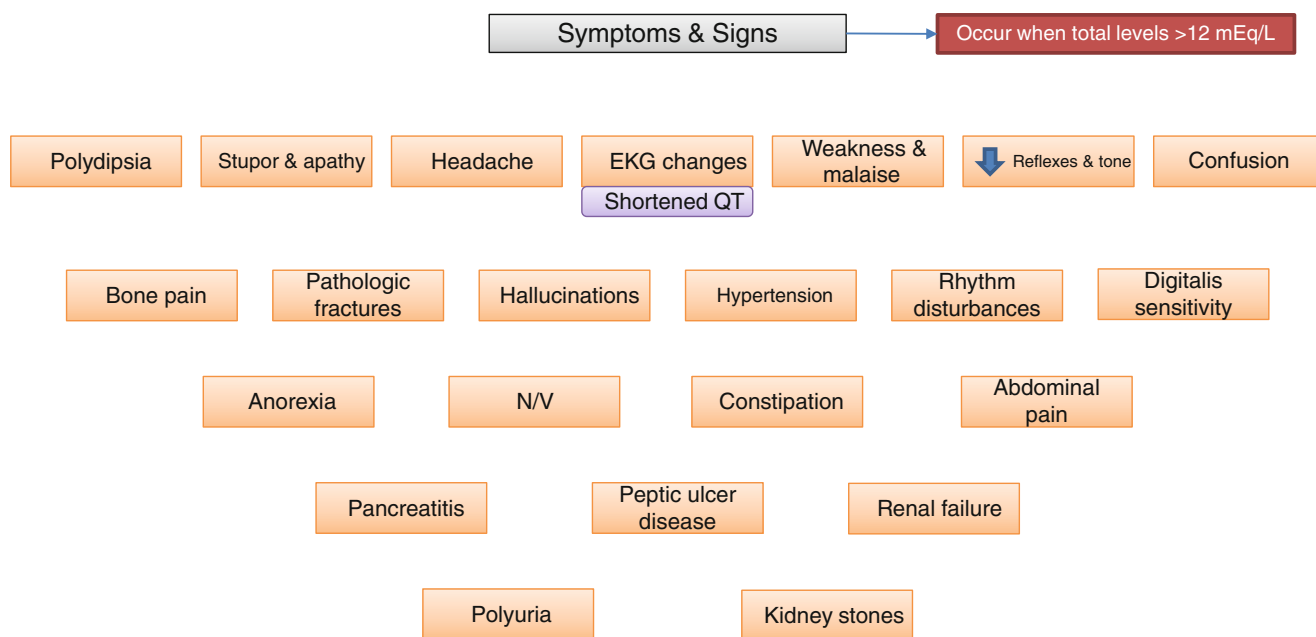
Introduction: Hypercalcemia



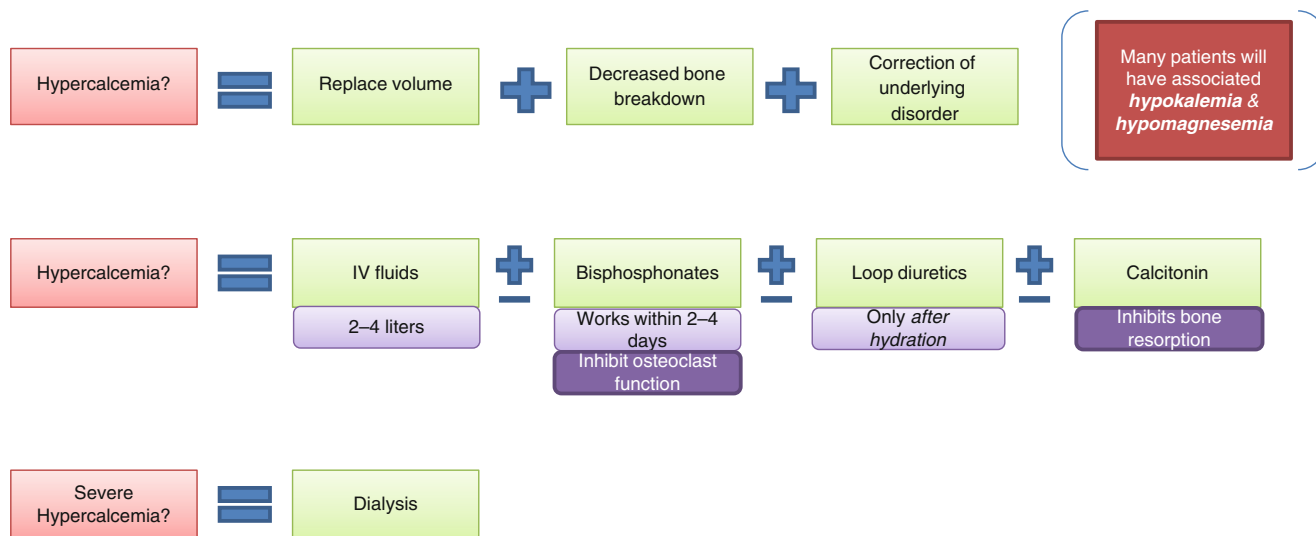
Causes of Hypercalcemia



Hypercalcemia Symptoms and Signs

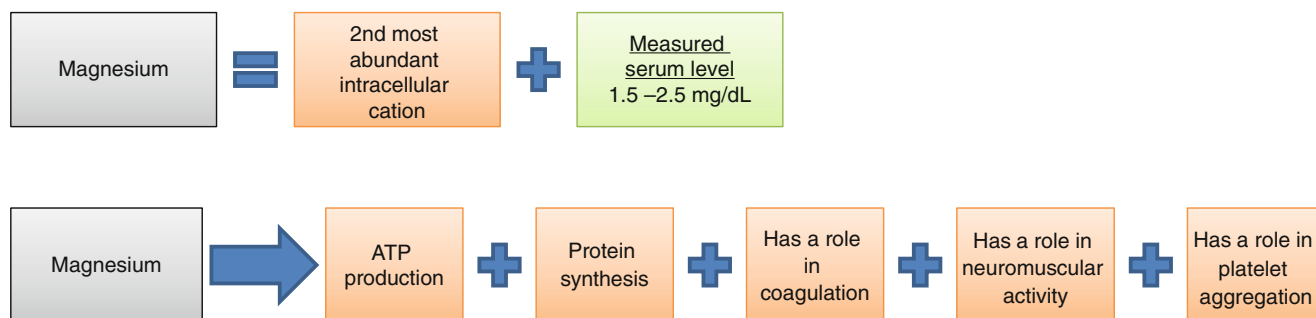


Diagnosis + Treatment

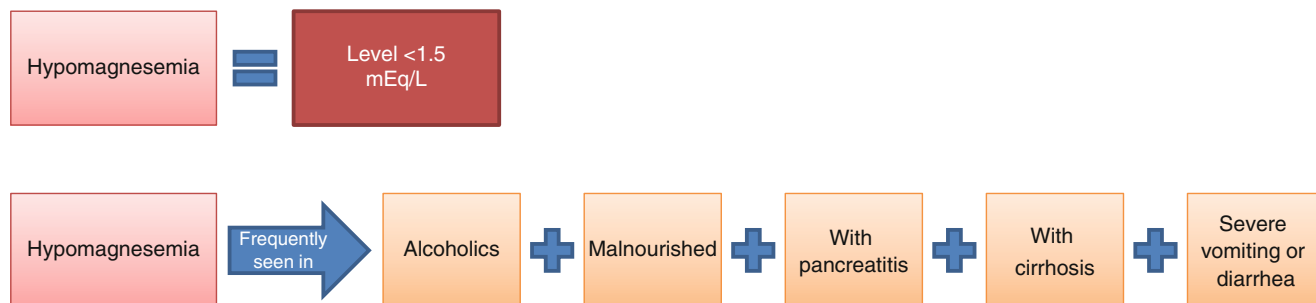


Magnesium

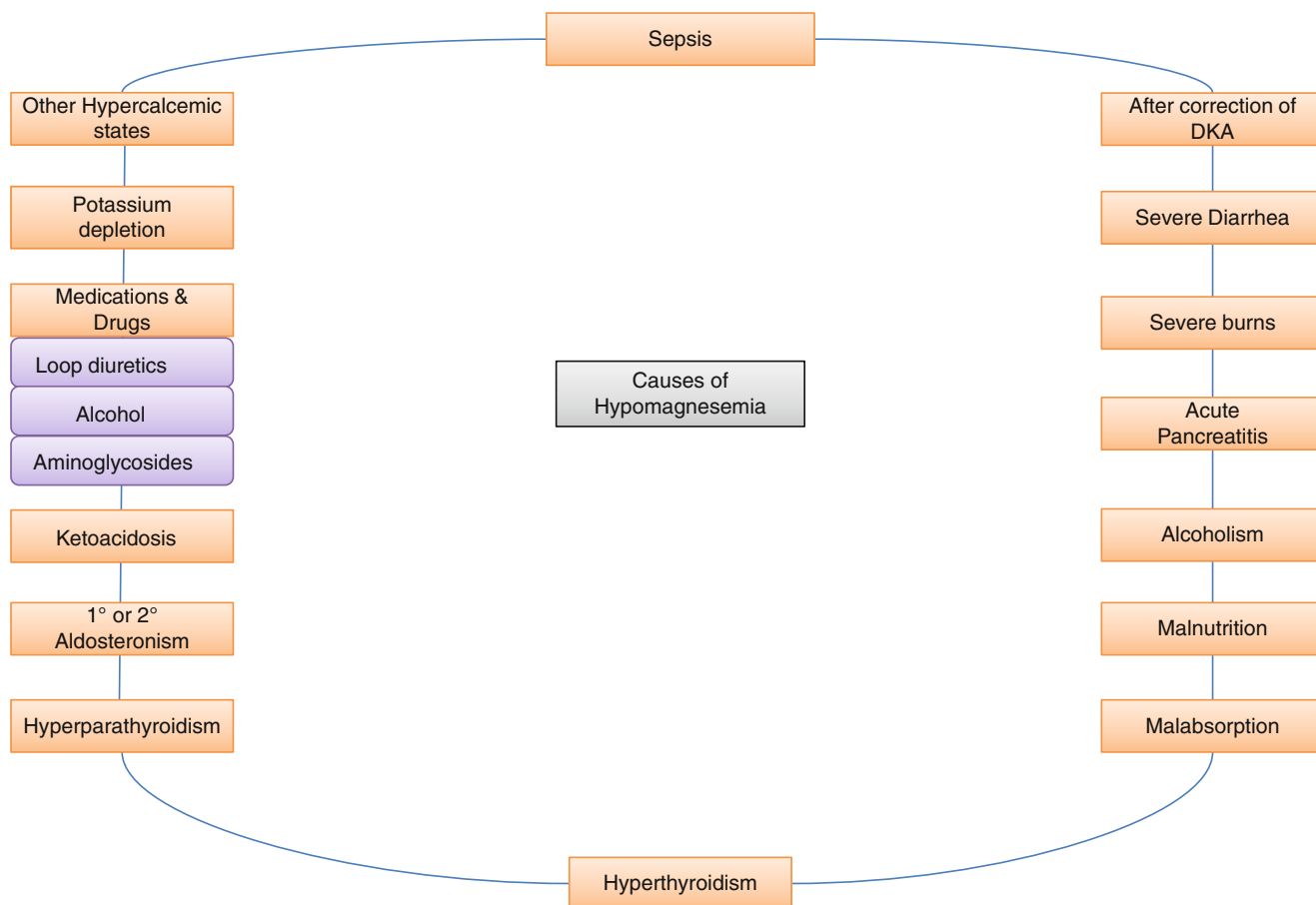
Introduction



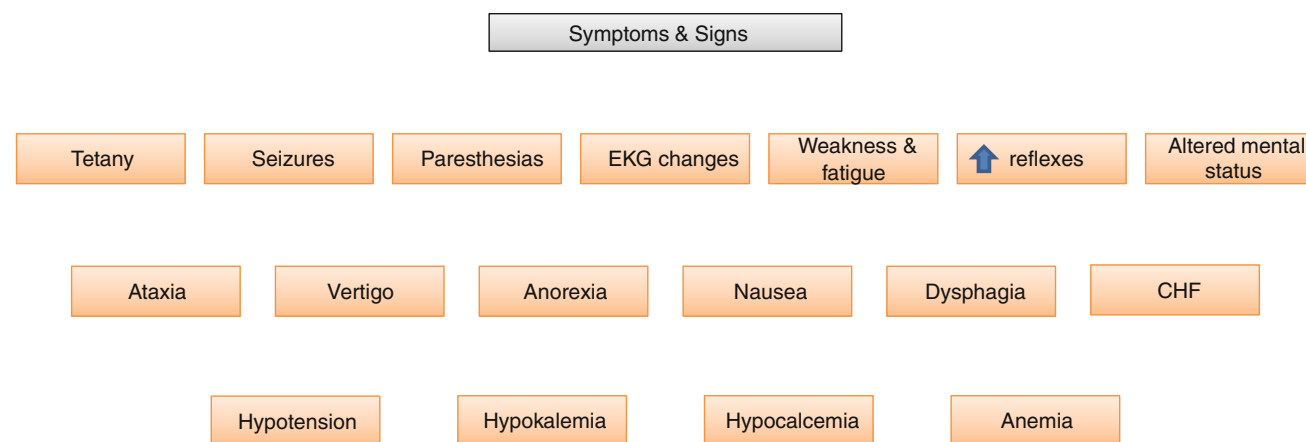
Introduction: Hypomagnesemia



Causes of Hypomagnesemia



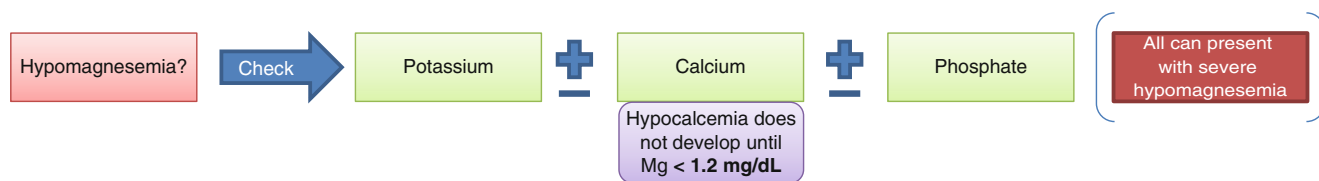
Hypomagnesemia Symptoms and Signs



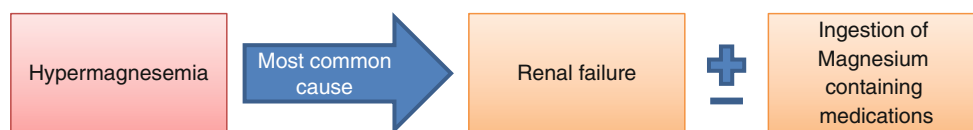
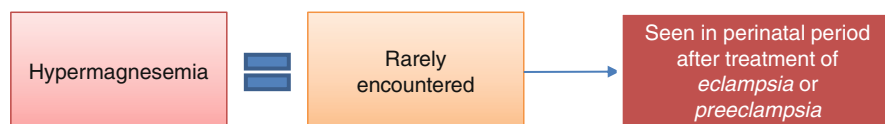
In presence of *normal Calcium levels* may have positive Chvostek or Trousseau sign

EKG changes in Hypomagnesemia **Very similar** to hypocalcemia & hypokalemia

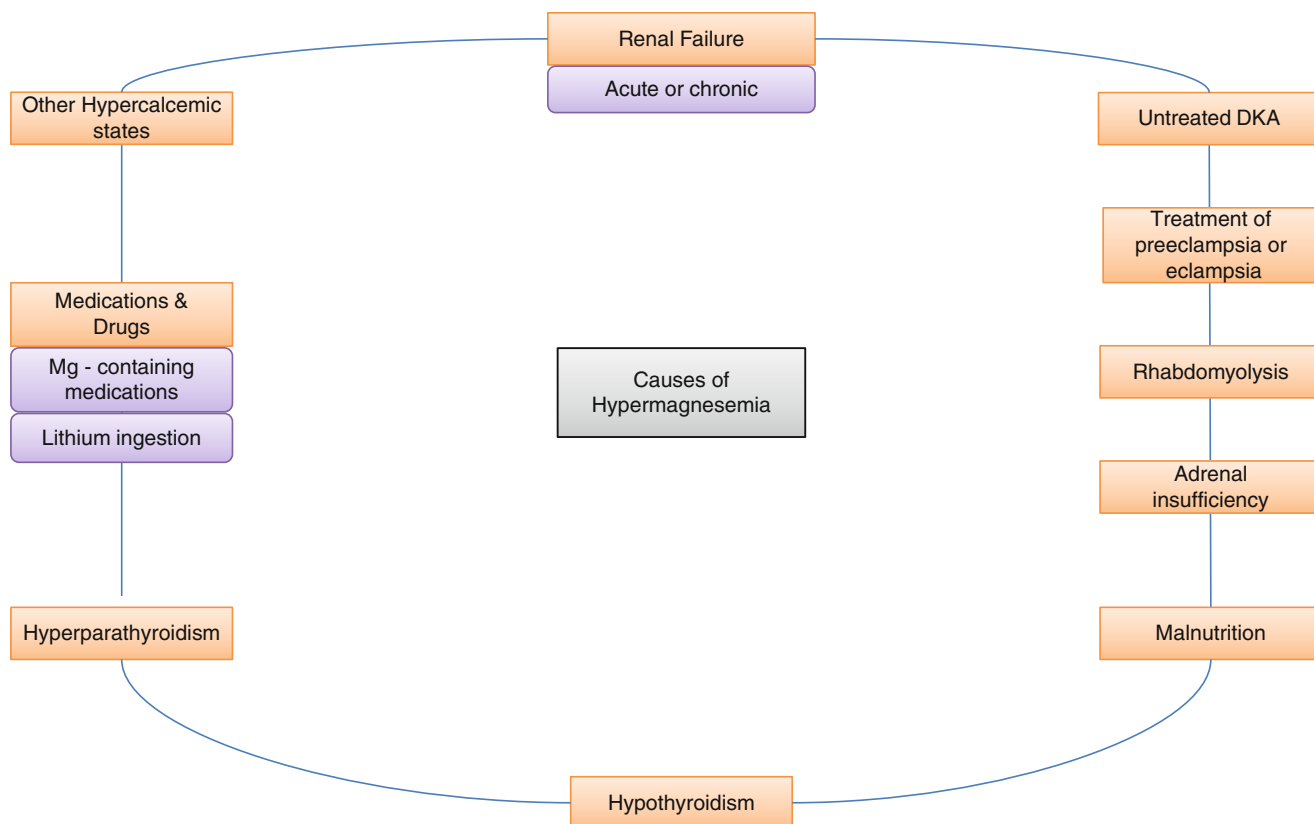
Diagnosis + Treatment



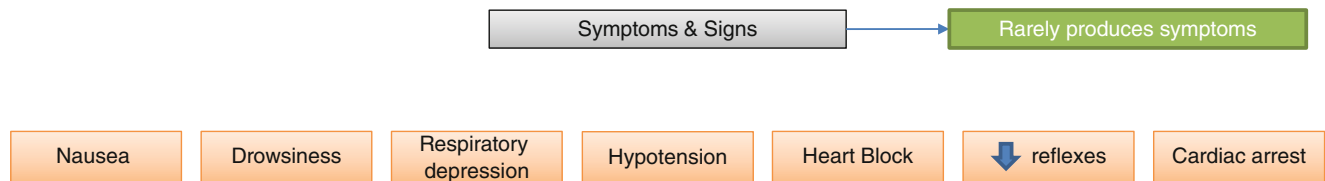
Introduction: Hypermagnesemia



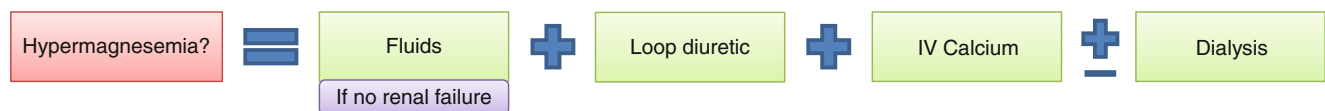
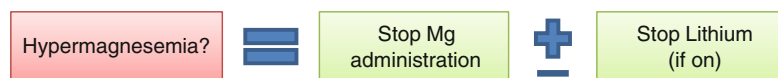
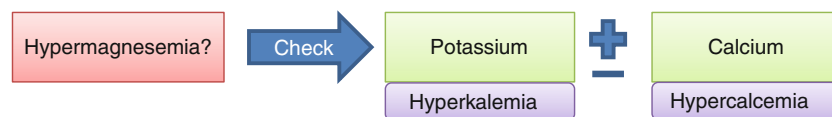
Causes of Hypermagnesemia



Hypermagnesemia Symptoms and Signs

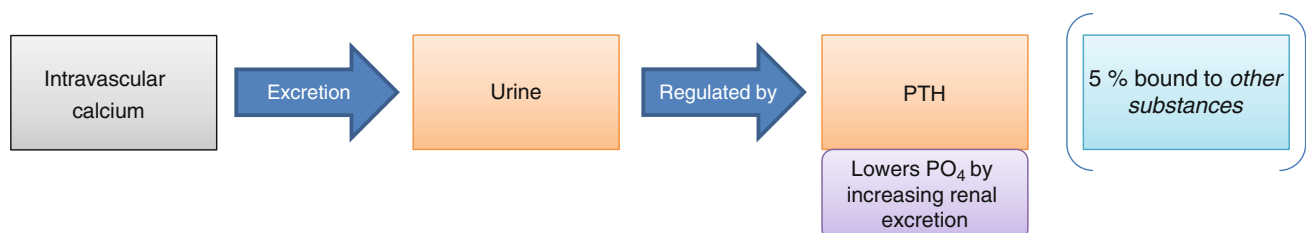
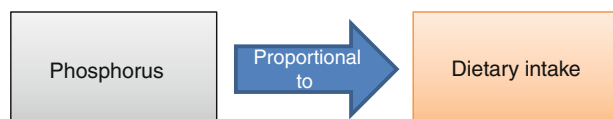


Diagnosis + Treatment

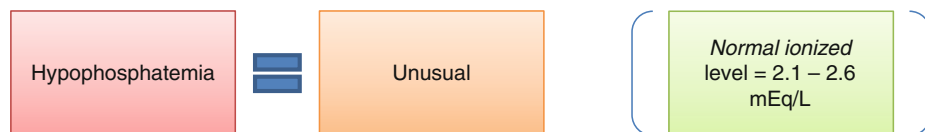


Phosphorus

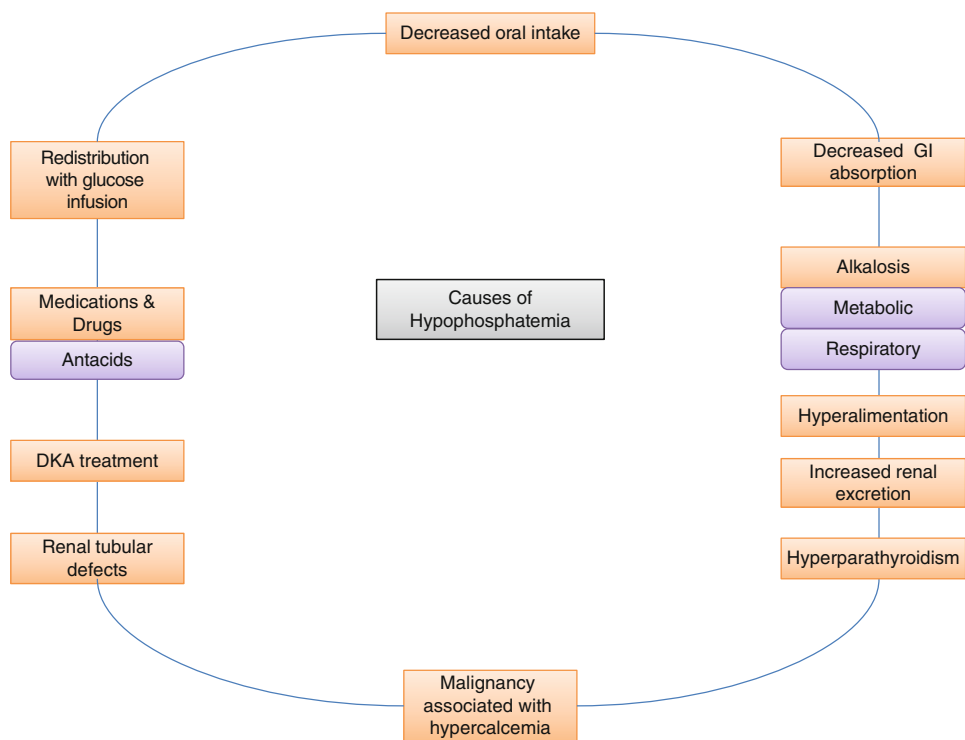
Introduction



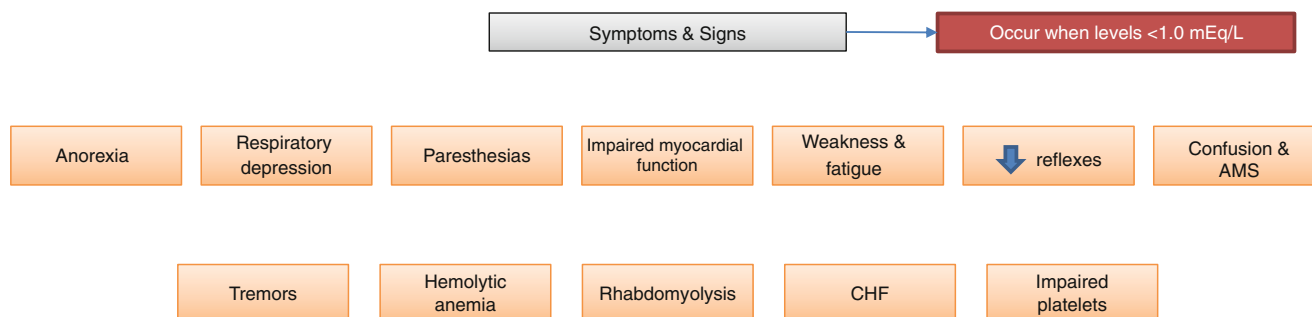
Introduction: Hypophosphatemia



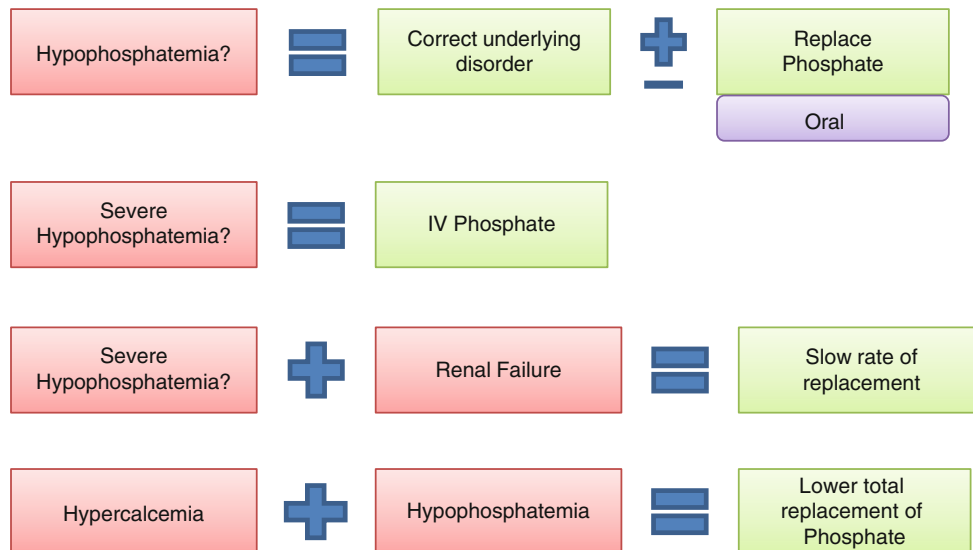
Causes of Hypophosphatemia



Hypophosphatemia Symptoms and Signs



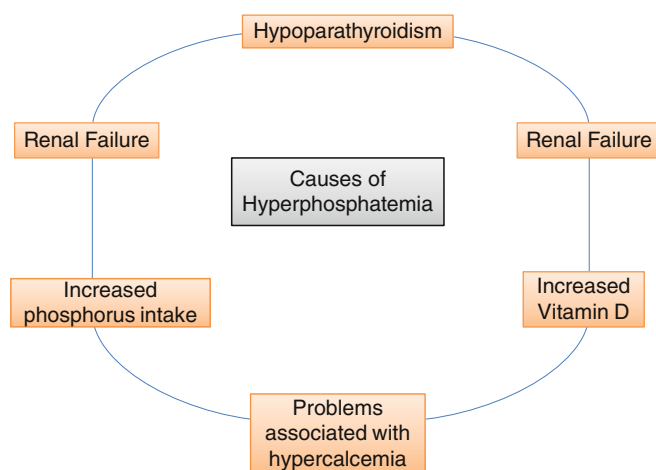
Diagnosis + Treatment



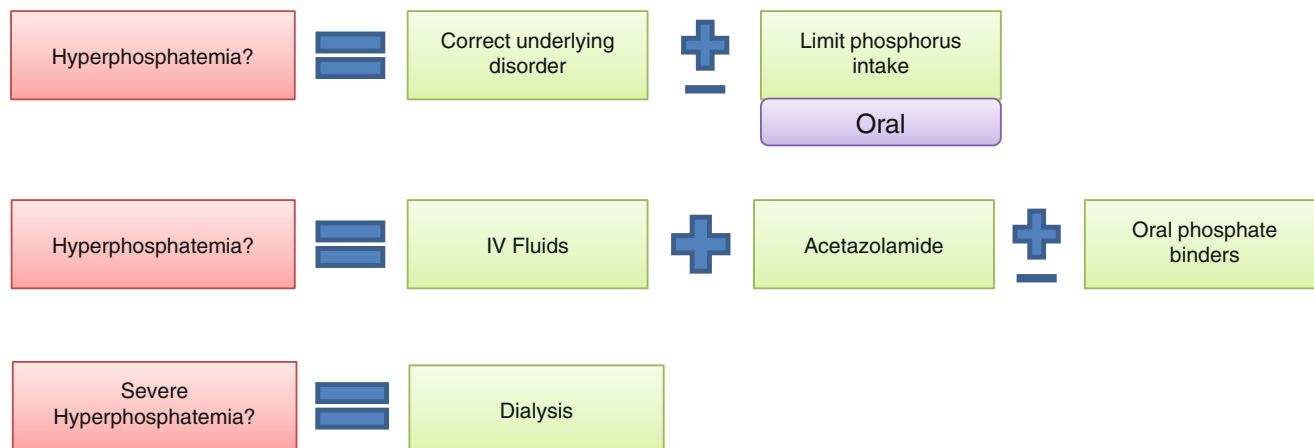
Introduction: Hyperphosphatemia



Causes of Hyperphosphatemia

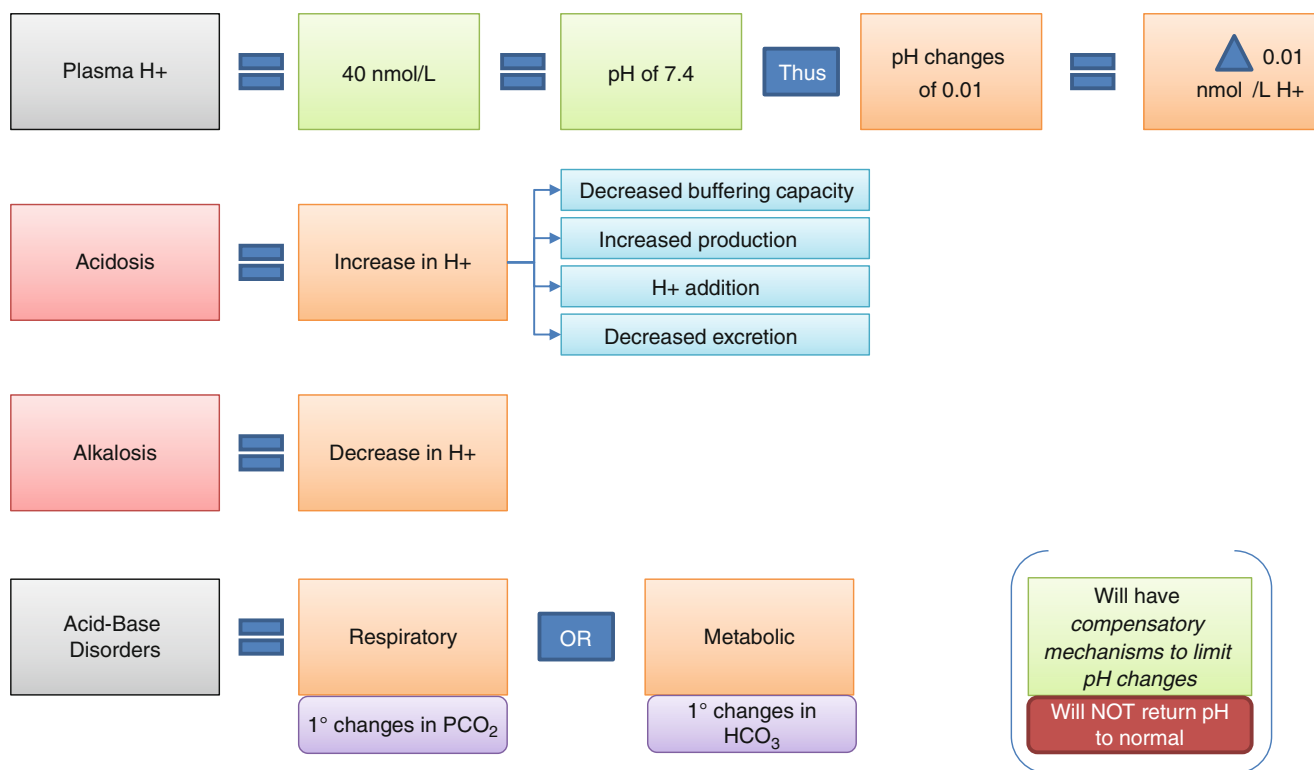


Diagnosis + Treatment

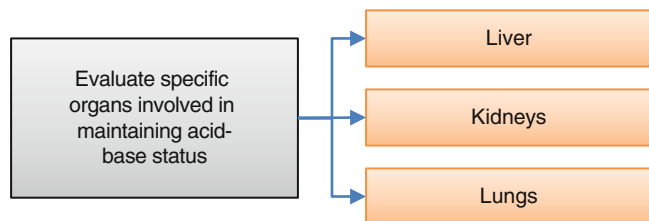
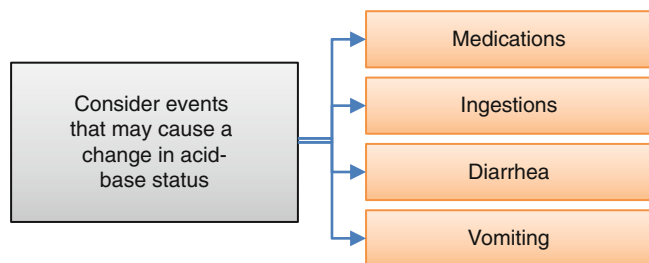


Metabolic Derangements

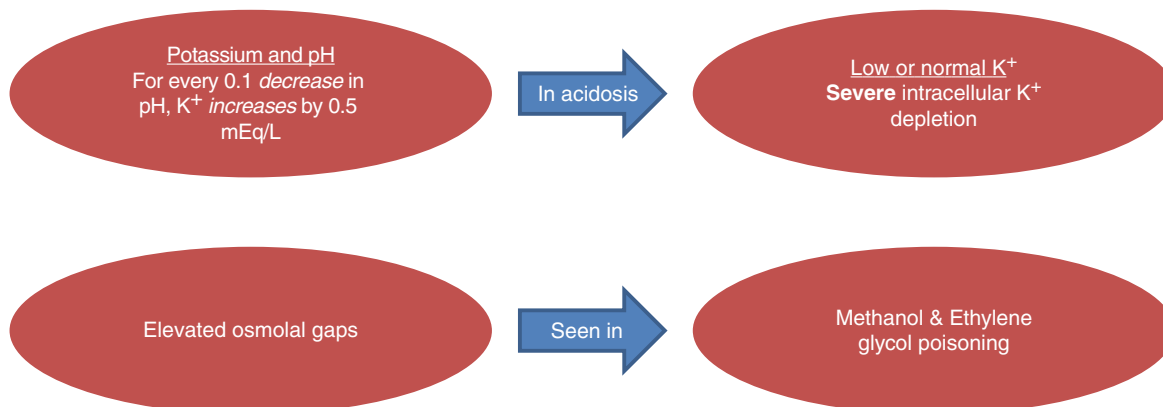
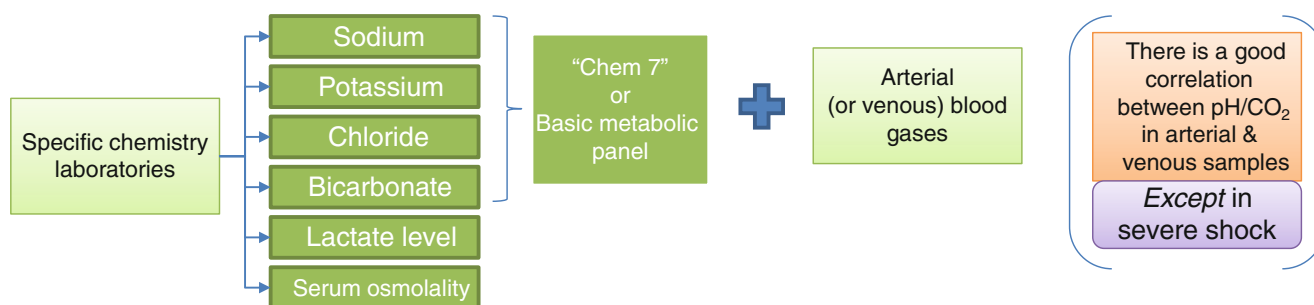
Introduction



History and Physical

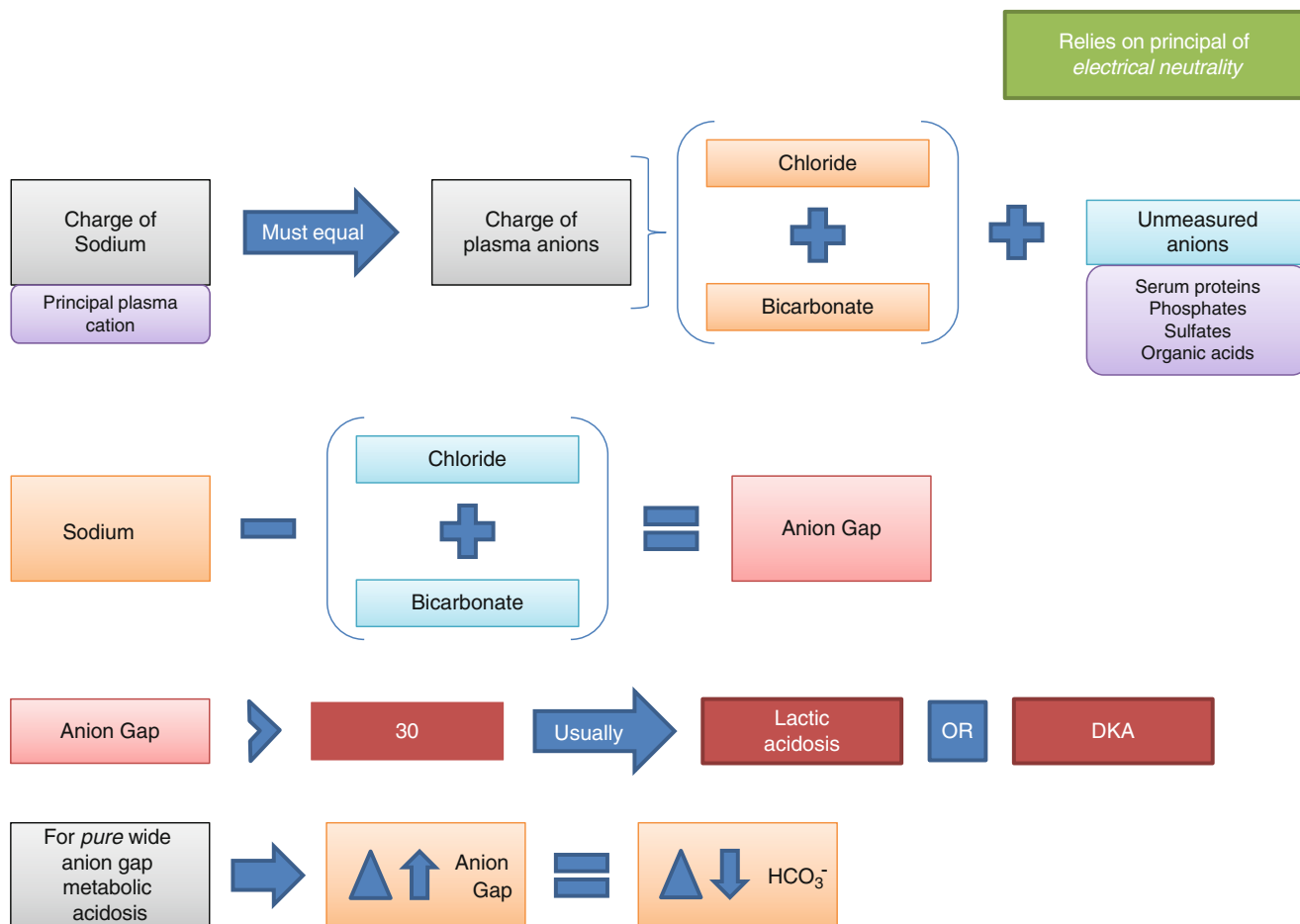


Laboratory Investigations

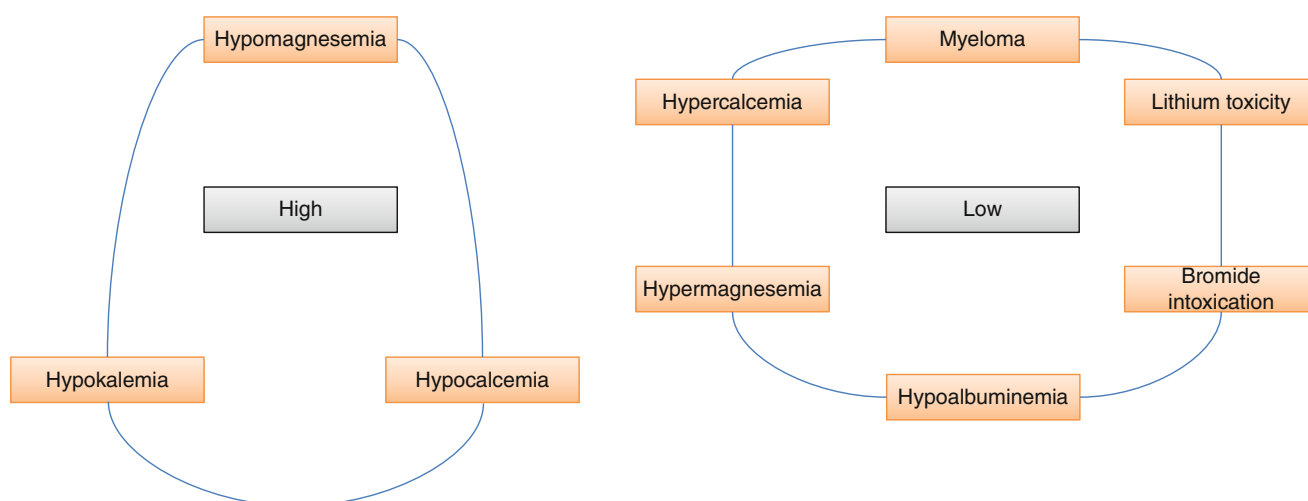


Metabolic Acidosis

Anion Gap



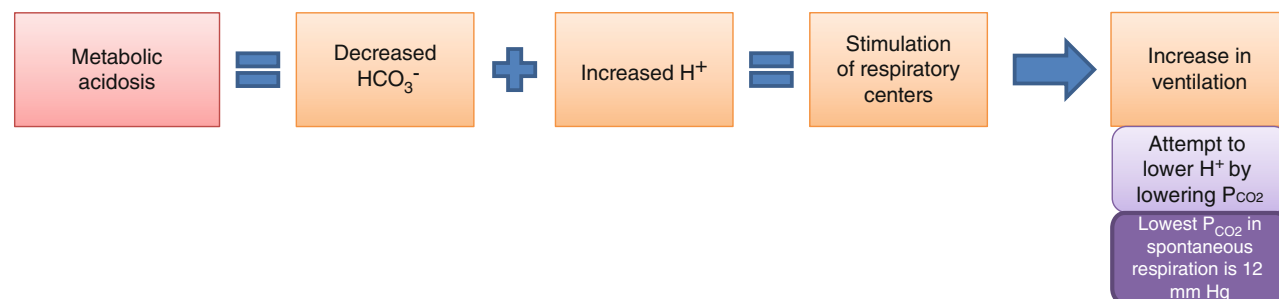
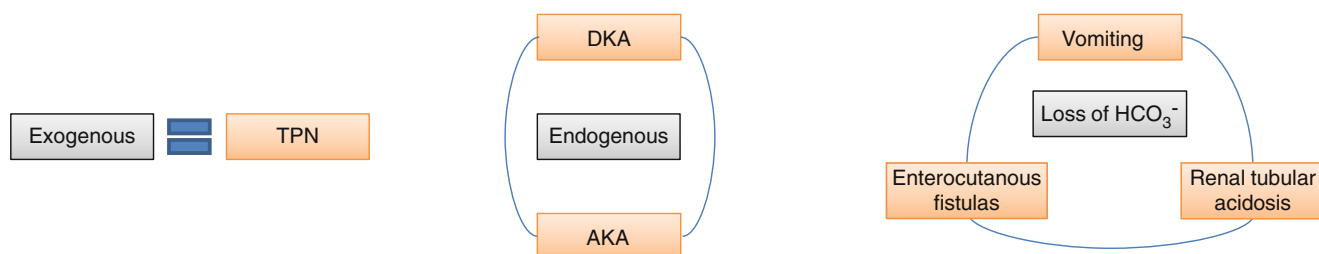
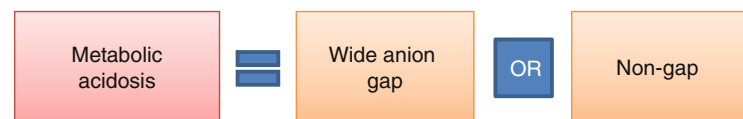
Abnormal Anion Gap Without Acid-Base Disturbance

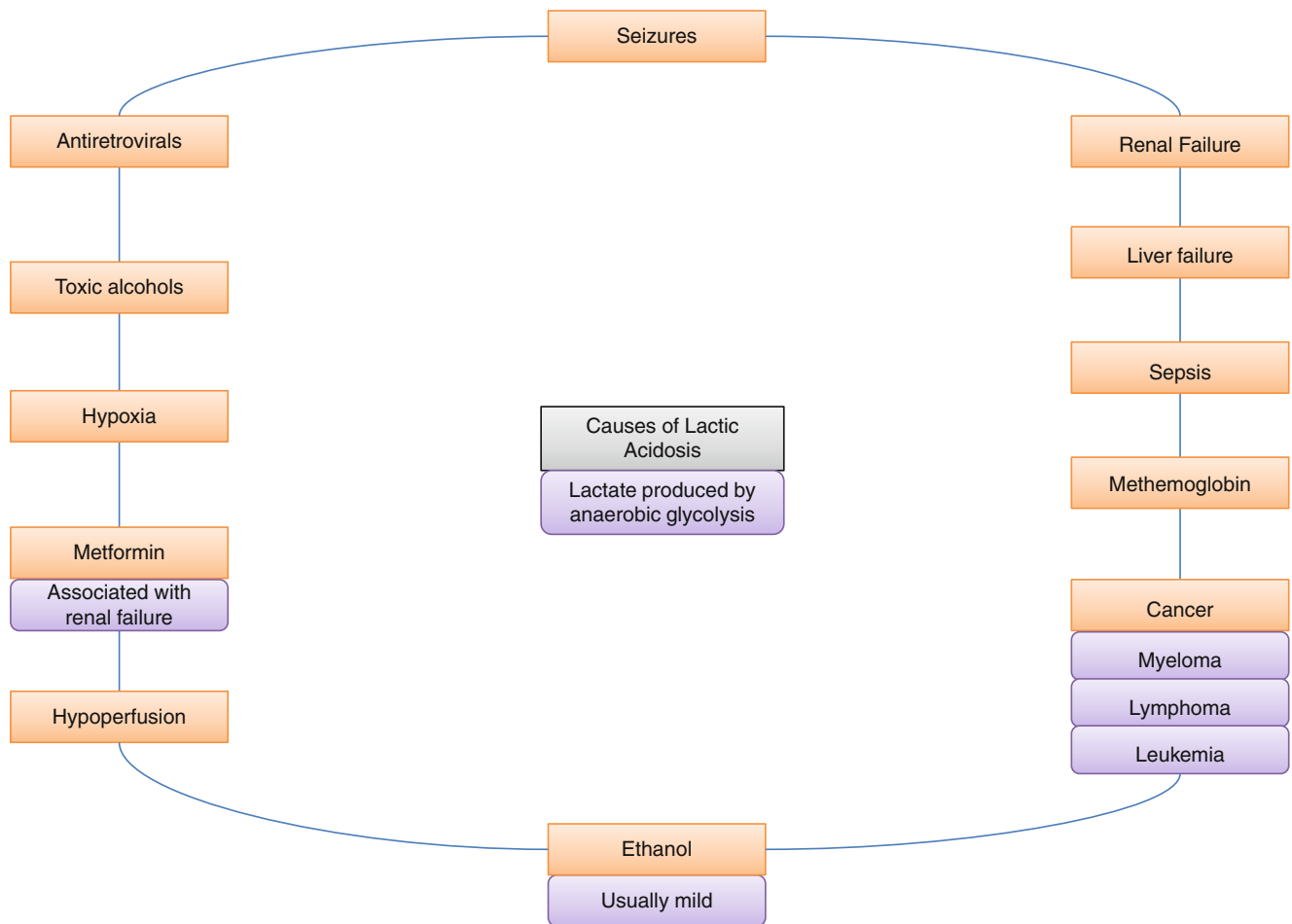


Anion Gap Causes

A	AKA	=	Abrupt cessation of alcohol + malnourishment	=	Ketoacidosis
C	Cyanide, Carbon monoxide	=	Toxic	=	Lactic acidosis
A	Aspirin	=	Ingestion		
T	Toluene	=	Toxic		
M	Methanol	=	Ingestion		
U	Uremia	=	Renal failure		
D	DKA	=	Ketoacidosis		
P	Propylene Glycol, Paraldehyde	=	Ingestion		
I	Iron, Isoniazid	=	Ingestion	=	Lactic acidosis
L	Lactic acidosis	=	Most common cause		
E	Ethylene Glycol, Ethanol	=	Ingestion		
S	Salicylates	=	Ingestion		

Metabolic Acidosis



Lactic Acidosis

Non-anion Gap Metabolic Acidosis Causes

H	Hypoaldosteronism (Addison disease)
A	Acetazolamide
R	Renal tubular acidosis
D	Diarrhea
U	Uterosigmoidostomy
P	Pancreatic fistula

Usually a loss of HCO_3^-
with loss of Na^+

Some may have a
tendency to
Hyperkalemia, while
others have a tendency
to *Hypokalemia*

Other causes

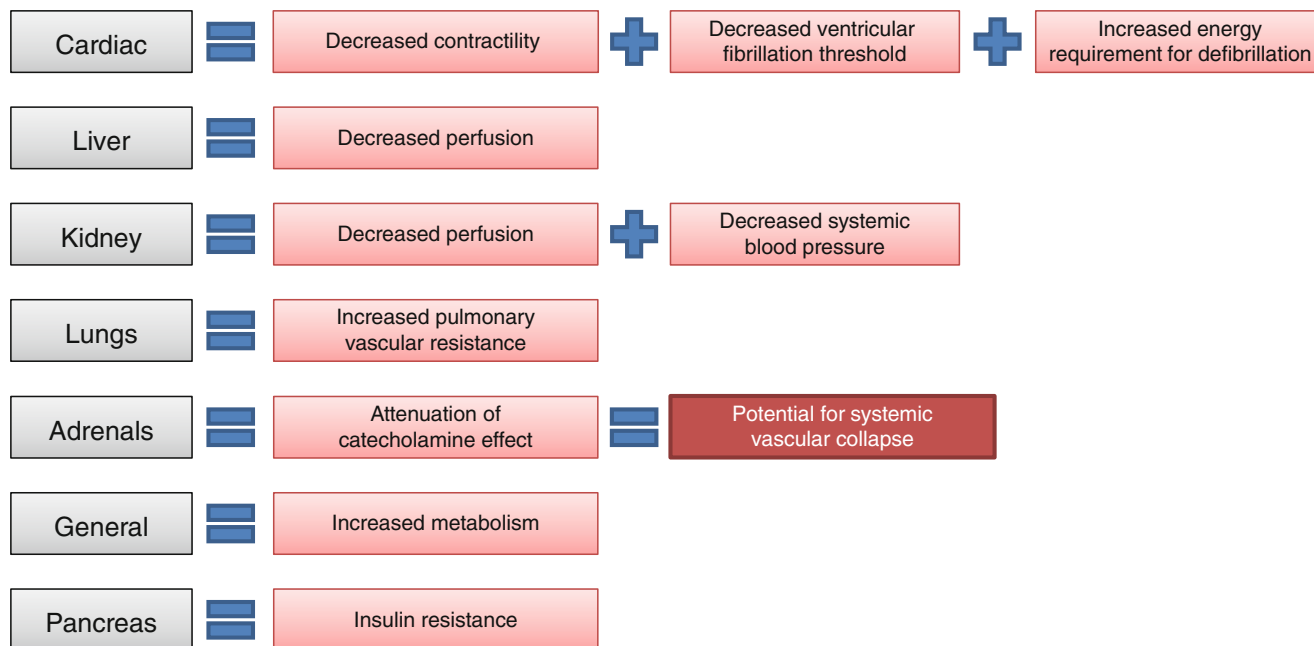
Improving DKA

Early Uremia

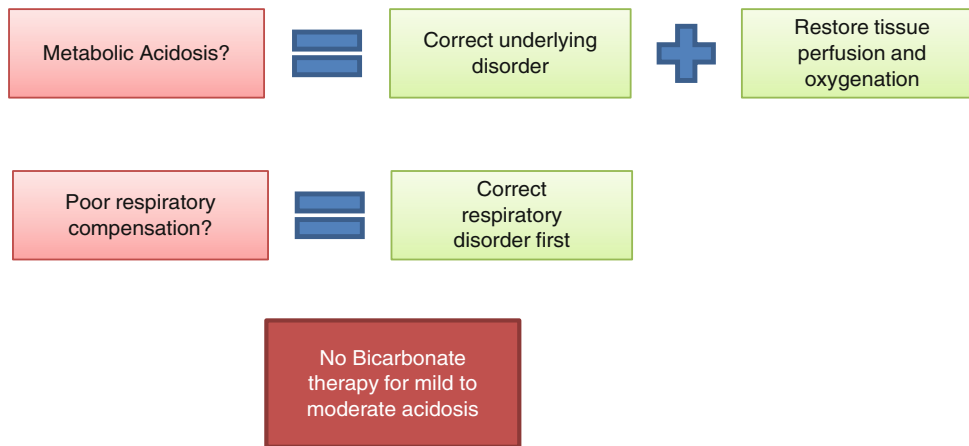
Early obstructive
uropathy

Other potassium sparing
diuretics

Effects of Acidosis

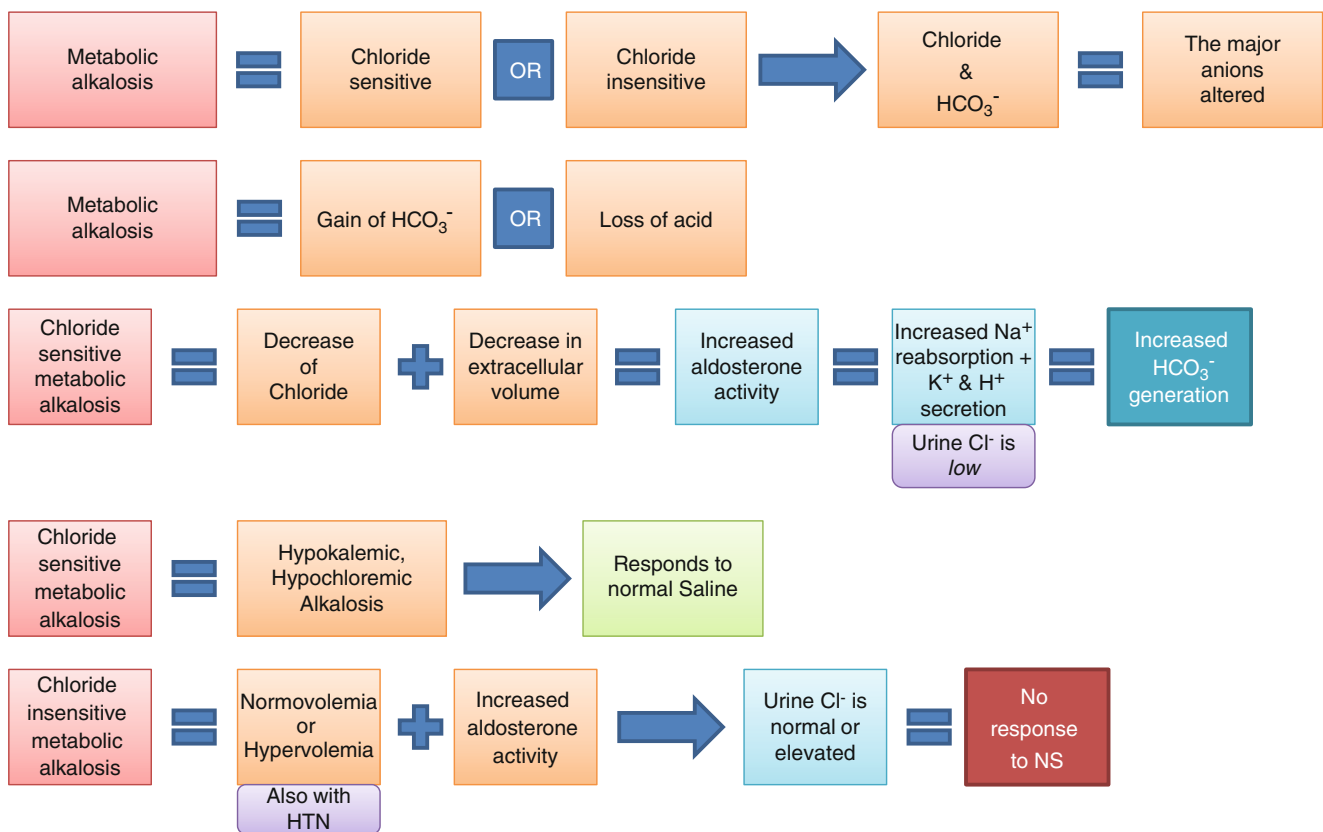


Treatment

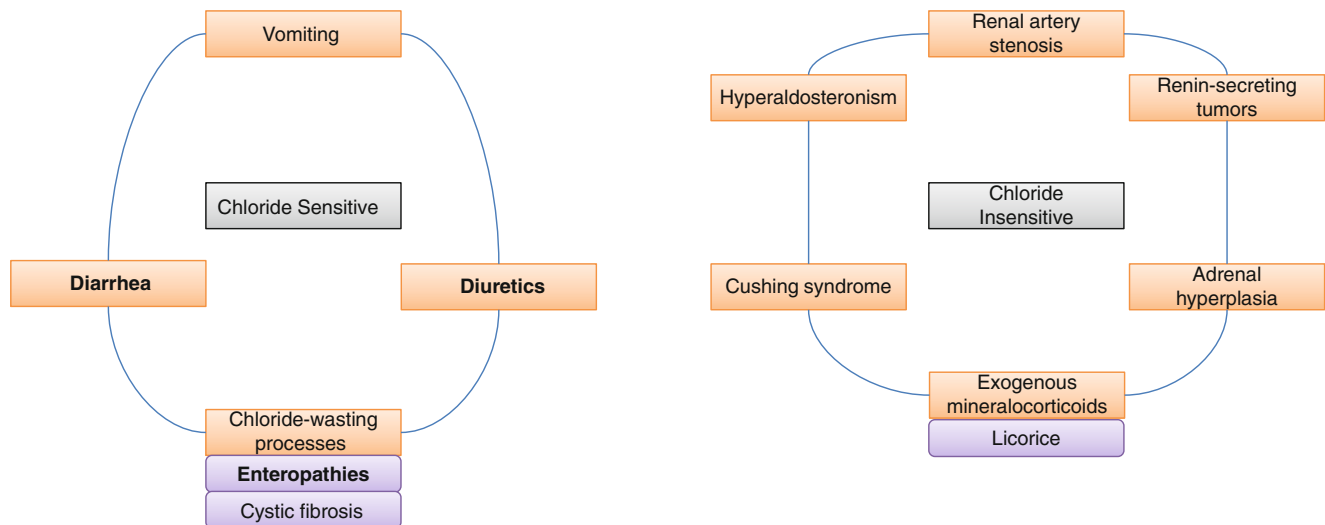


Metabolic Alkalosis

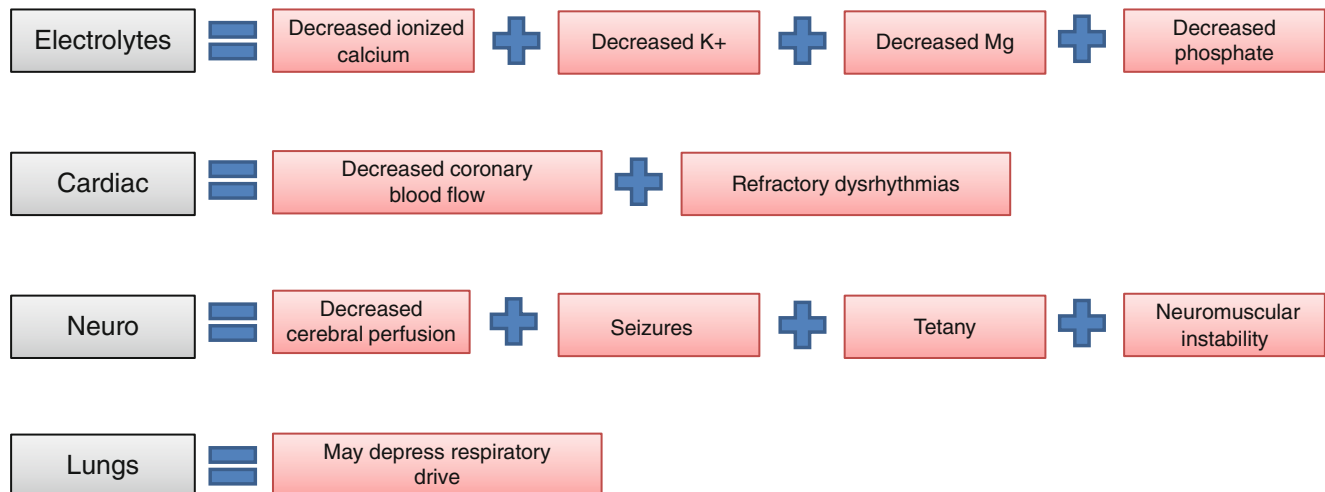
Introduction



Causes of Metabolic Alkalosis



Effects of Alkalosis



Treatment

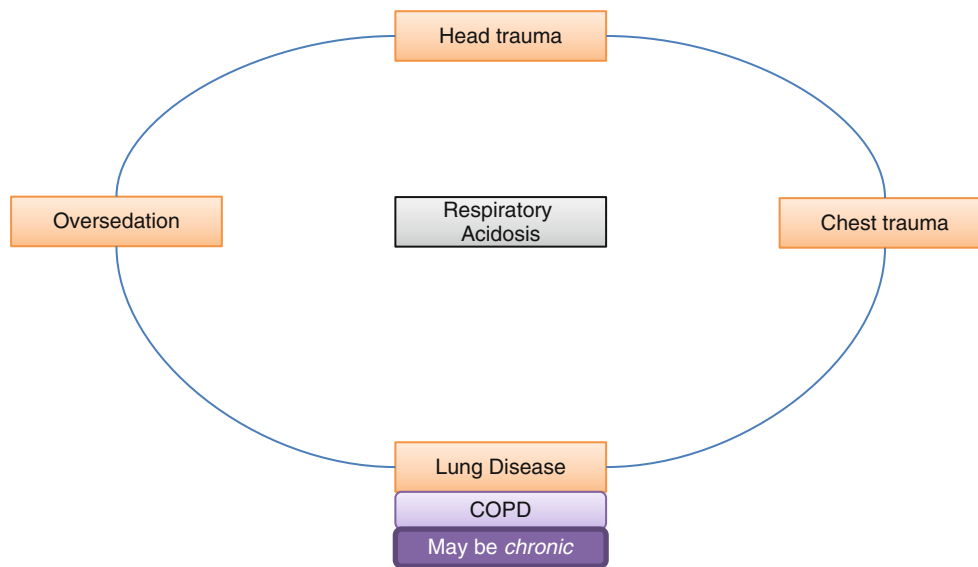


Respiratory Acidosis

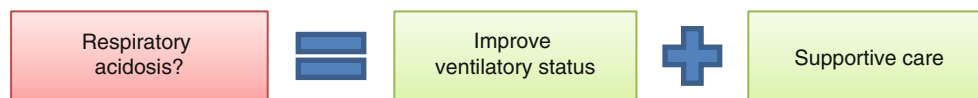
Introduction



Causes of Respiratory Acidosis



Treatment

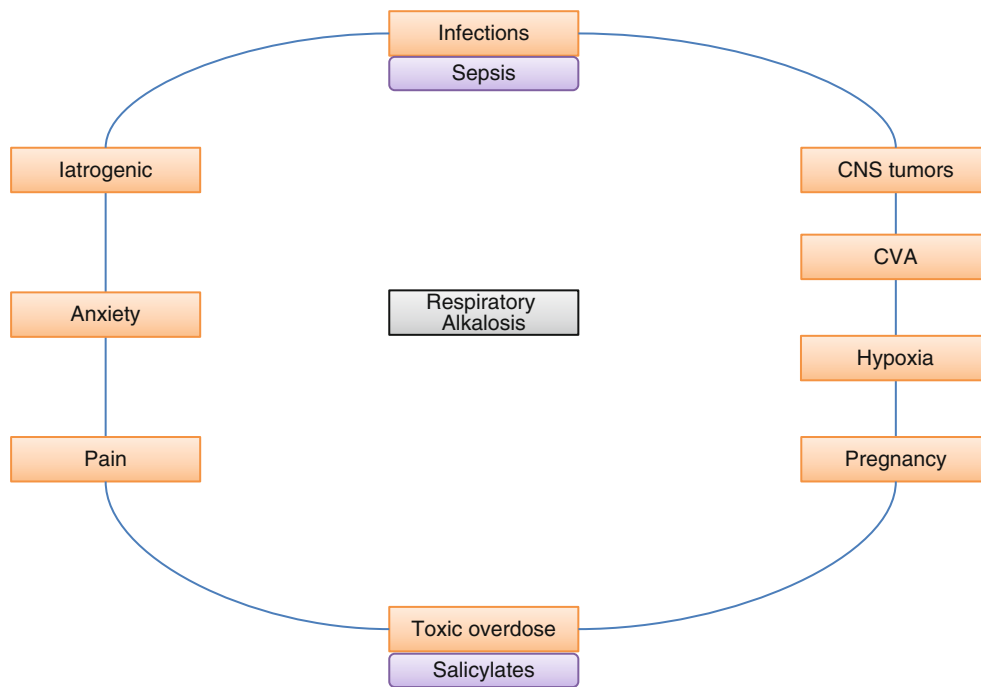


Respiratory Alkalosis

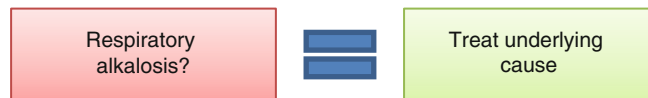
Introduction



Causes of Respiratory Alkalosis



Treatment



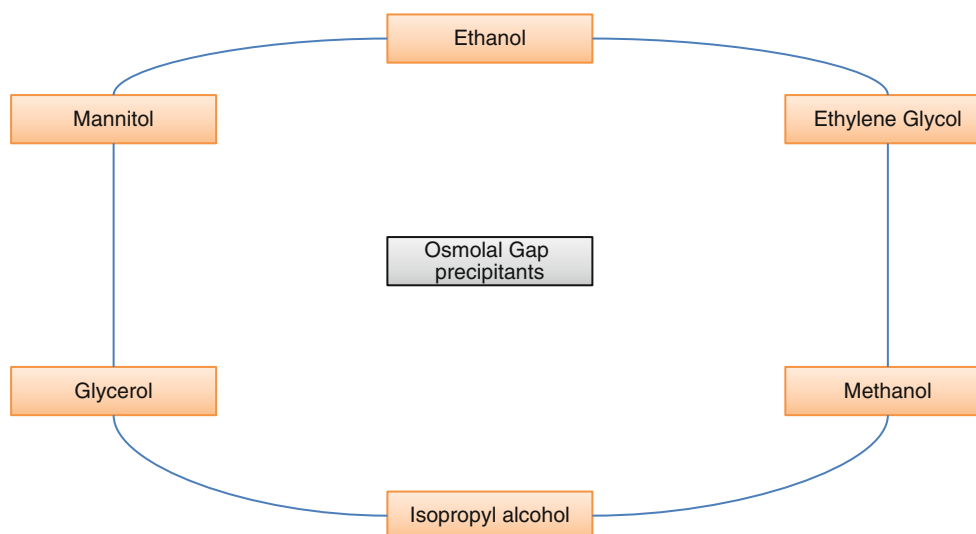
The Osmolal Gap

Introduction



$$2 \times \text{Na}^+ + \text{Glucose} / 18 + \text{BUN} / 2.8 = 280-295$$

Causes of Elevated Osmolal Gap



Ears, Nose, and Throat

Bobby Desai

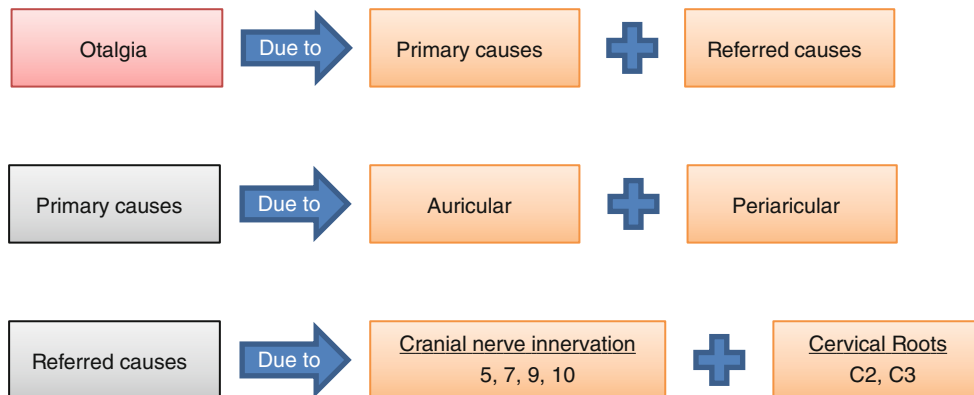
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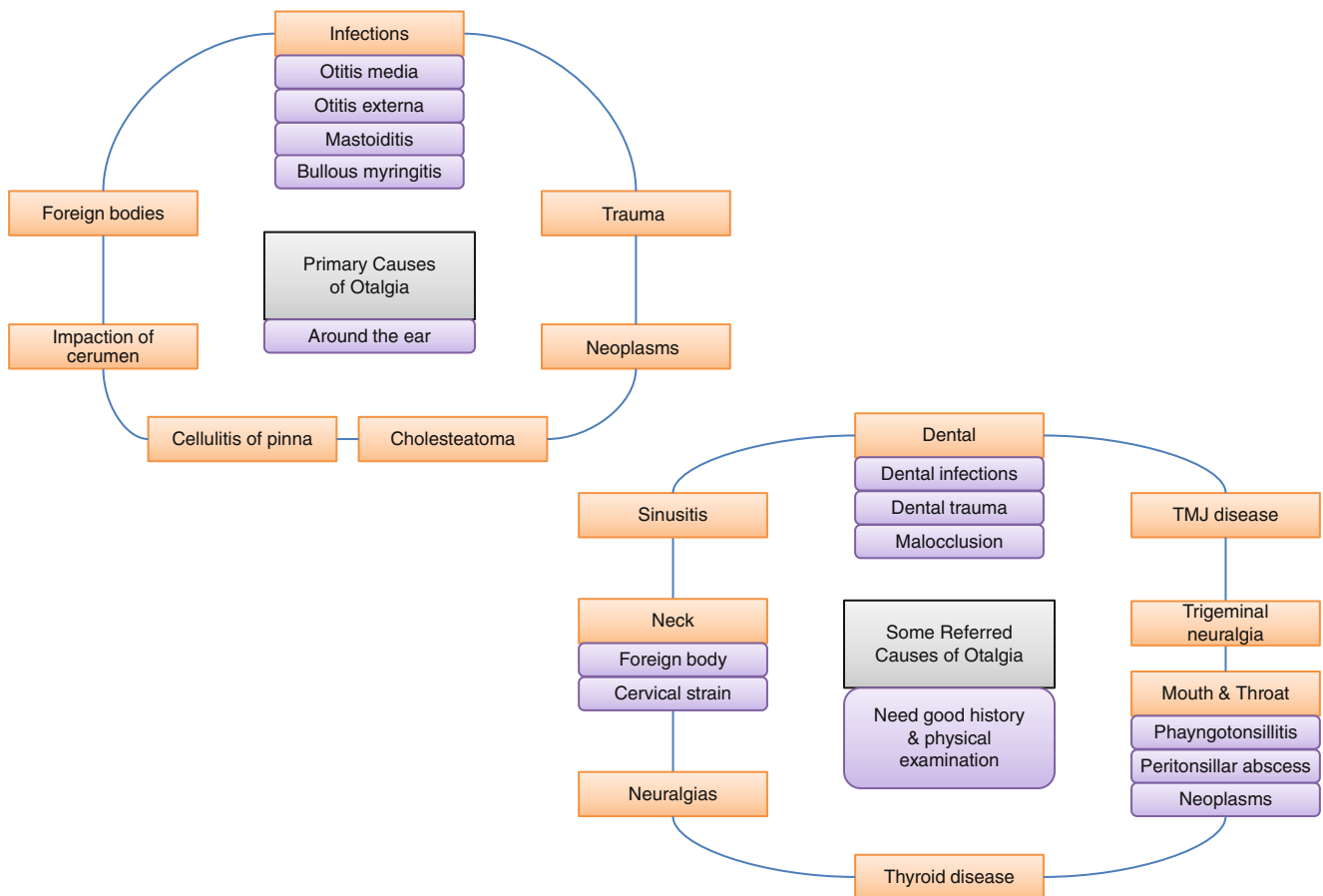
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Gainesville, FL, USA
e-mail: bdesai@ufl.edu

Ear

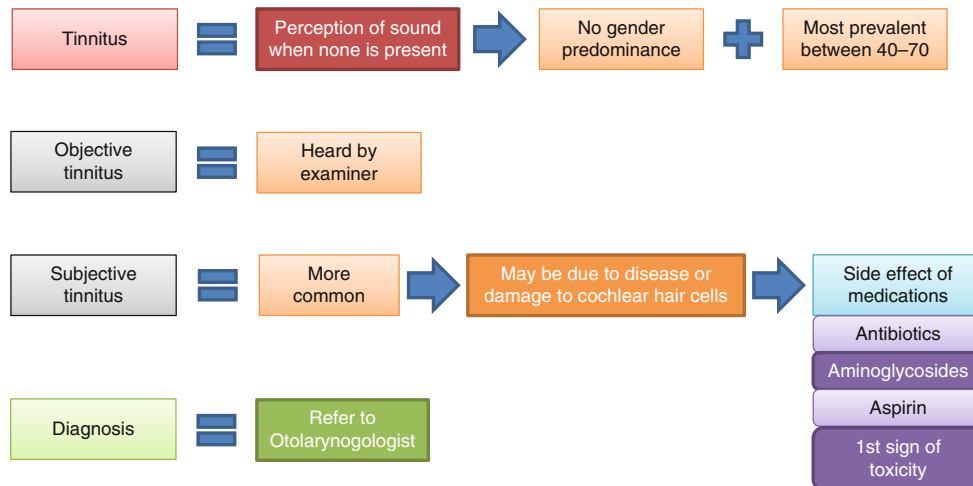
Introduction: Otalgia



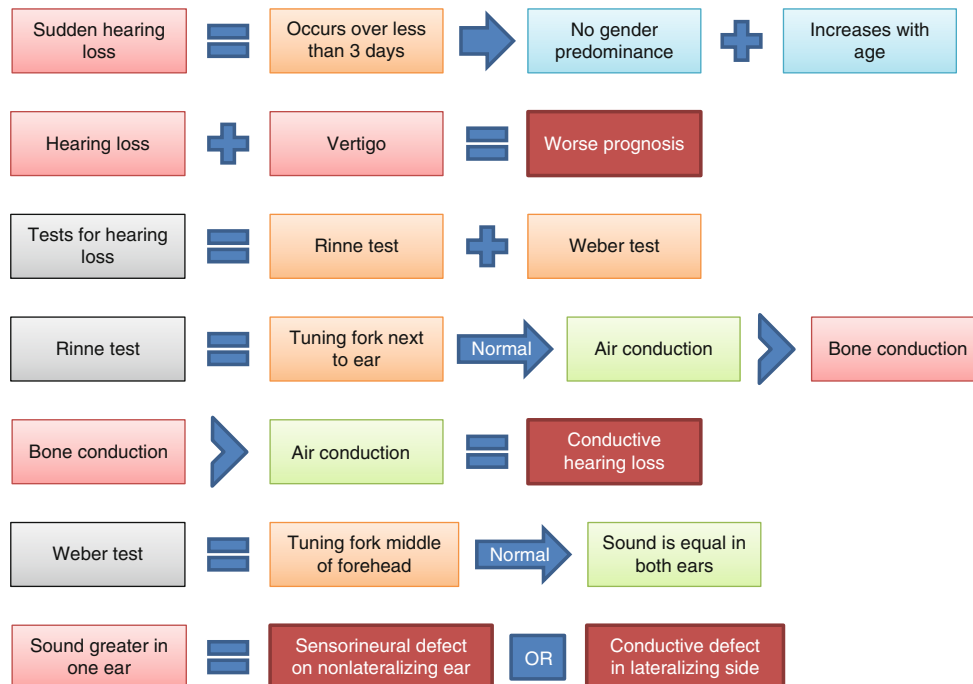
Primary and Referred Causes of Otalgia



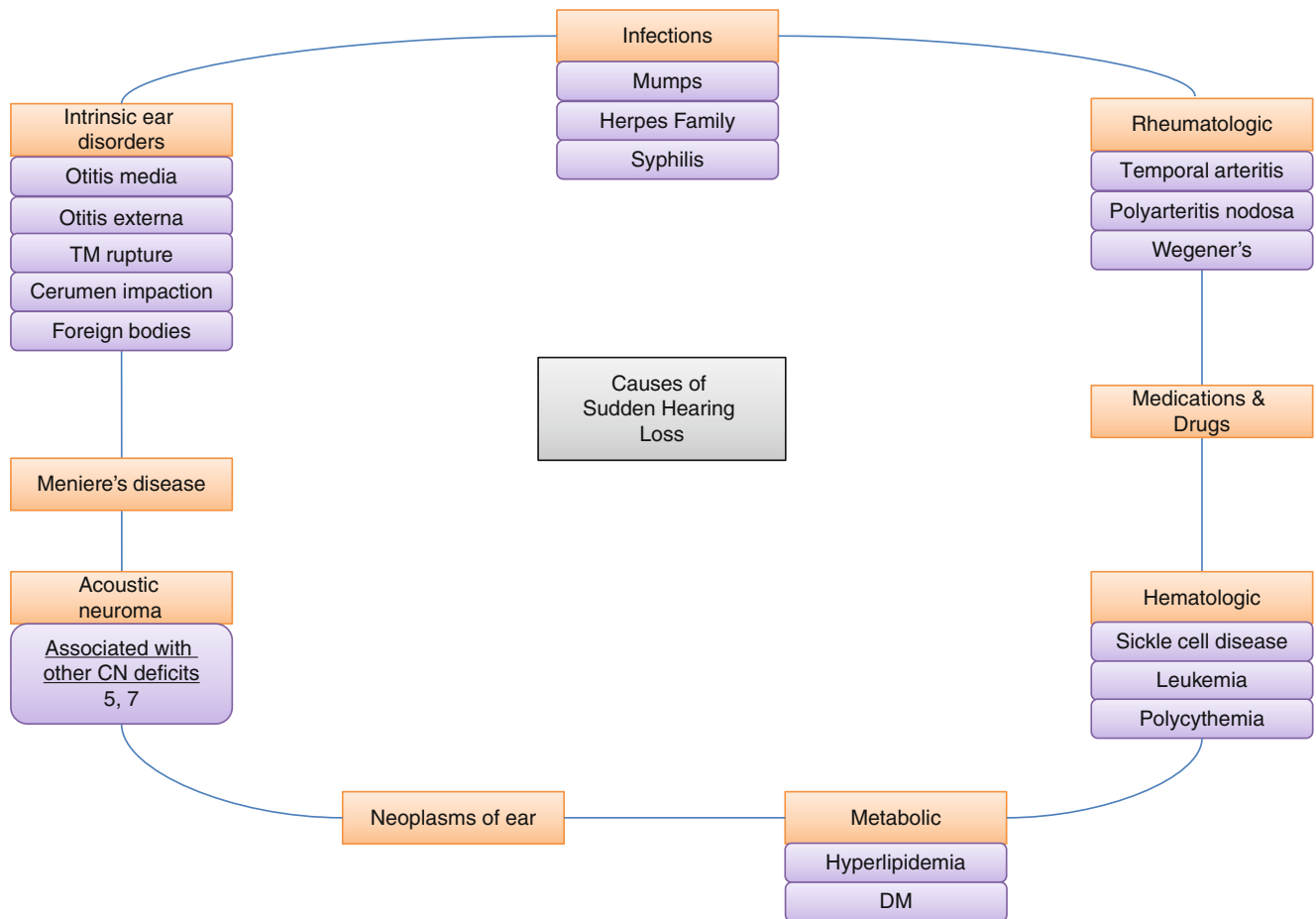
Introduction: Tinnitus



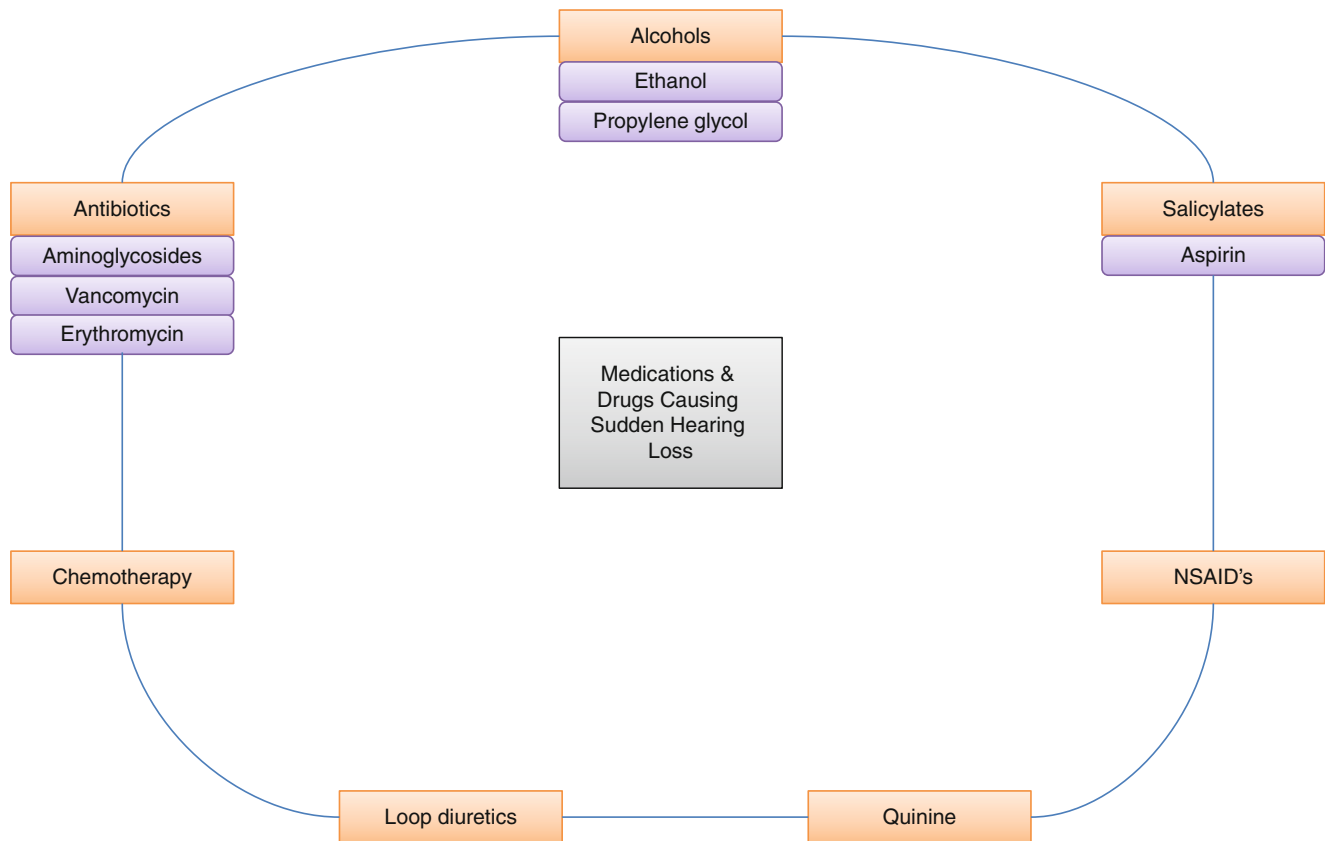
Introduction: Hearing Loss



Causes of Sudden Hearing Loss

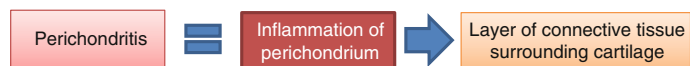


Medications and Drugs Causing Sudden Hearing Loss

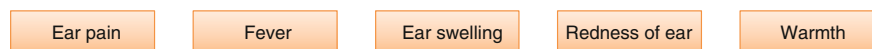


Ear Infections

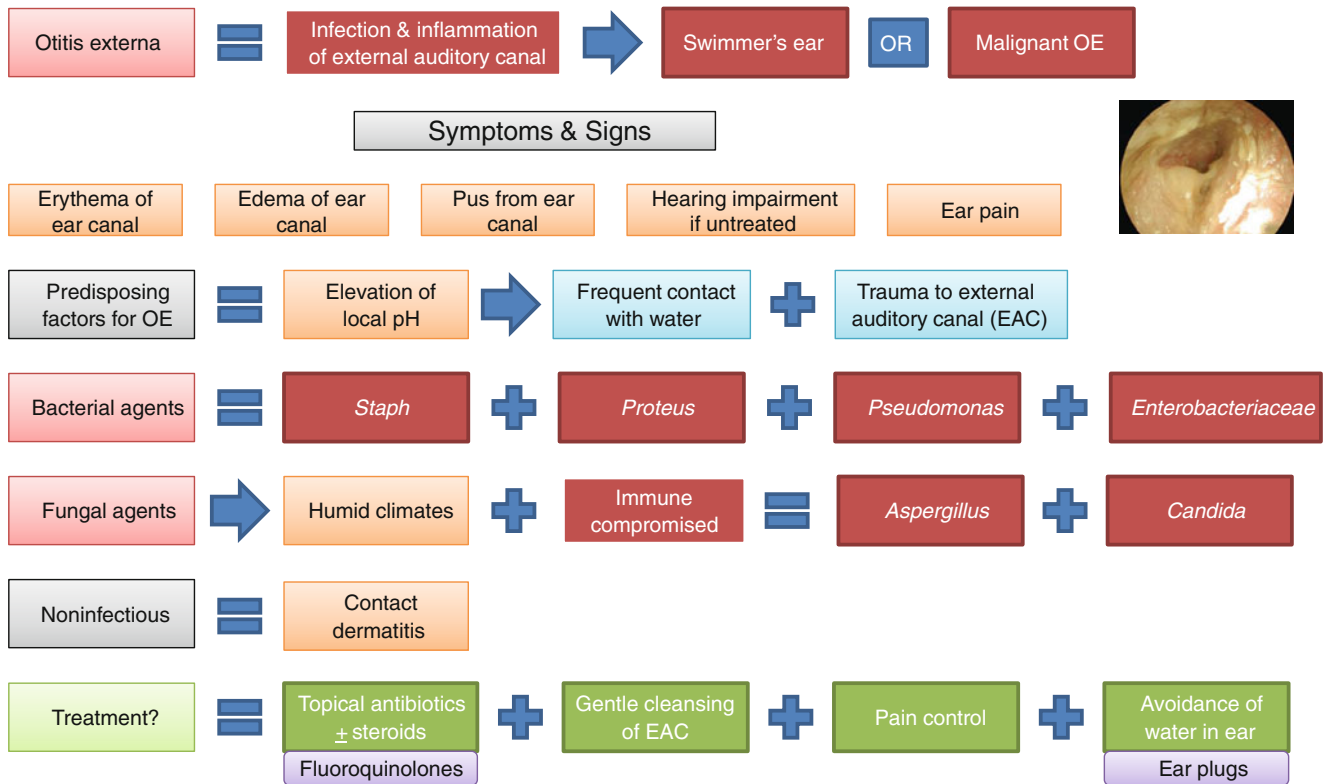
Perichondritis



Symptoms & Signs

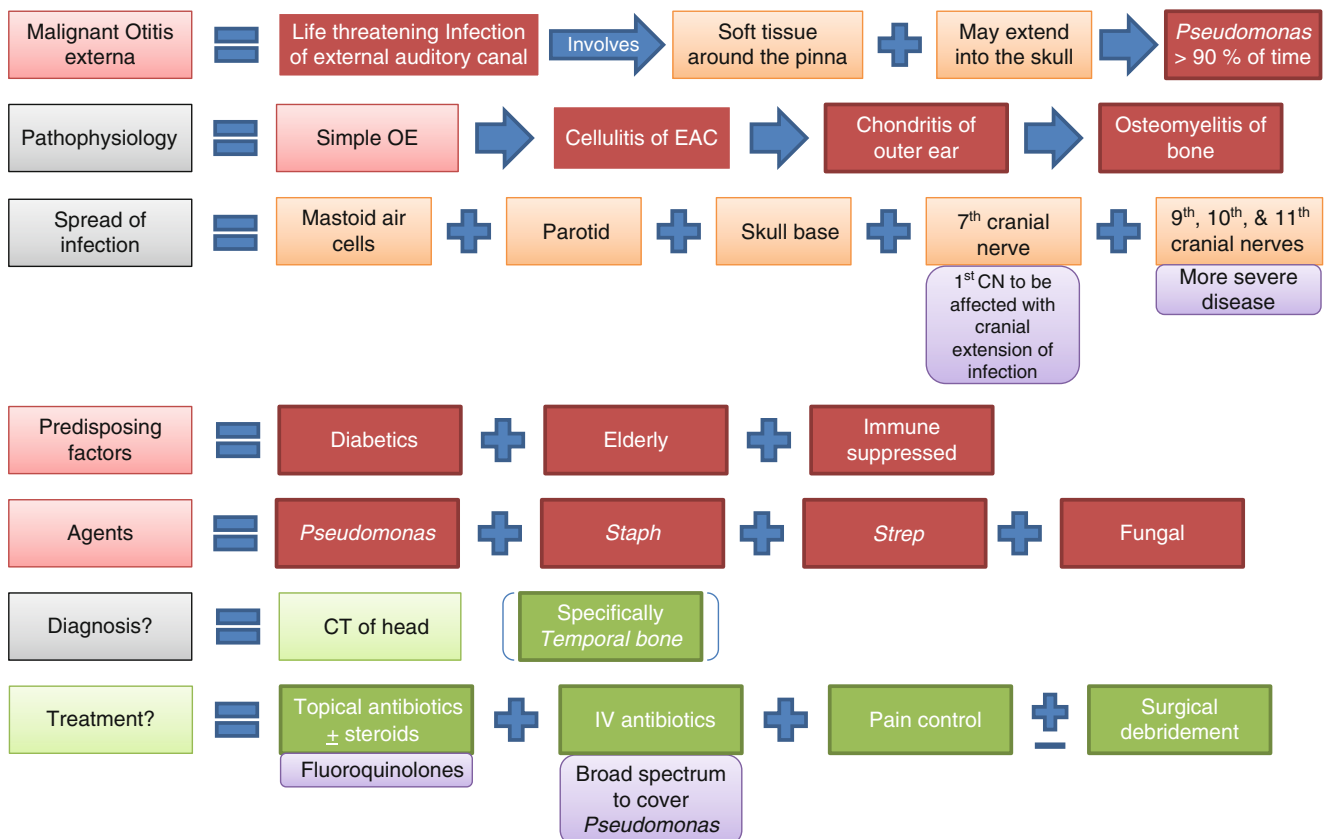


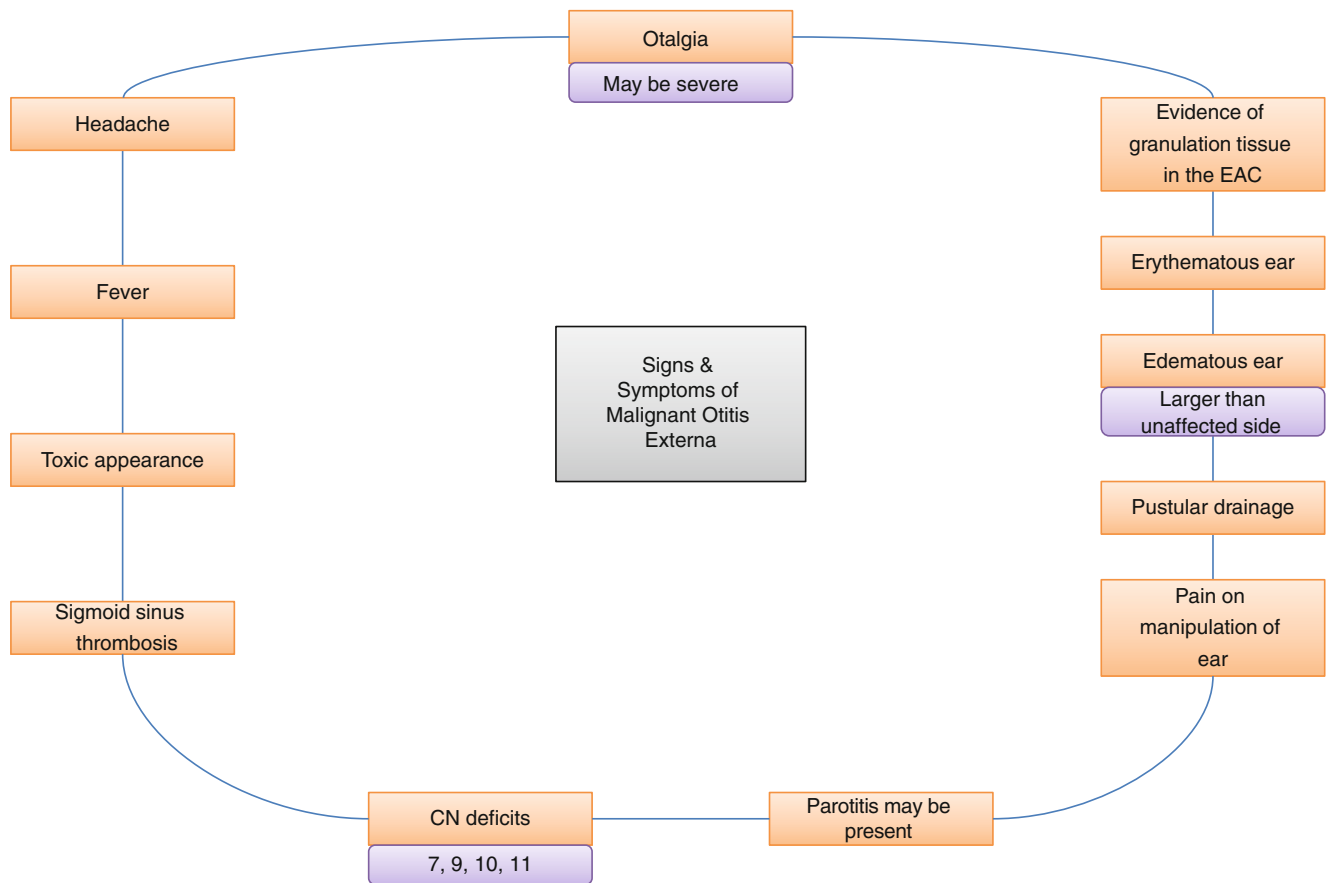
Otitis Externa (OE)



Center right image (Reprinted from Önerci TM. External ear canal. In: Önerci TM, editors. Diagnosis in otorhinolaryngology: an illustrated guide. Heidelberg: Springer Verlag; 2010. p. 18–23. With permission from Springer Verlag)

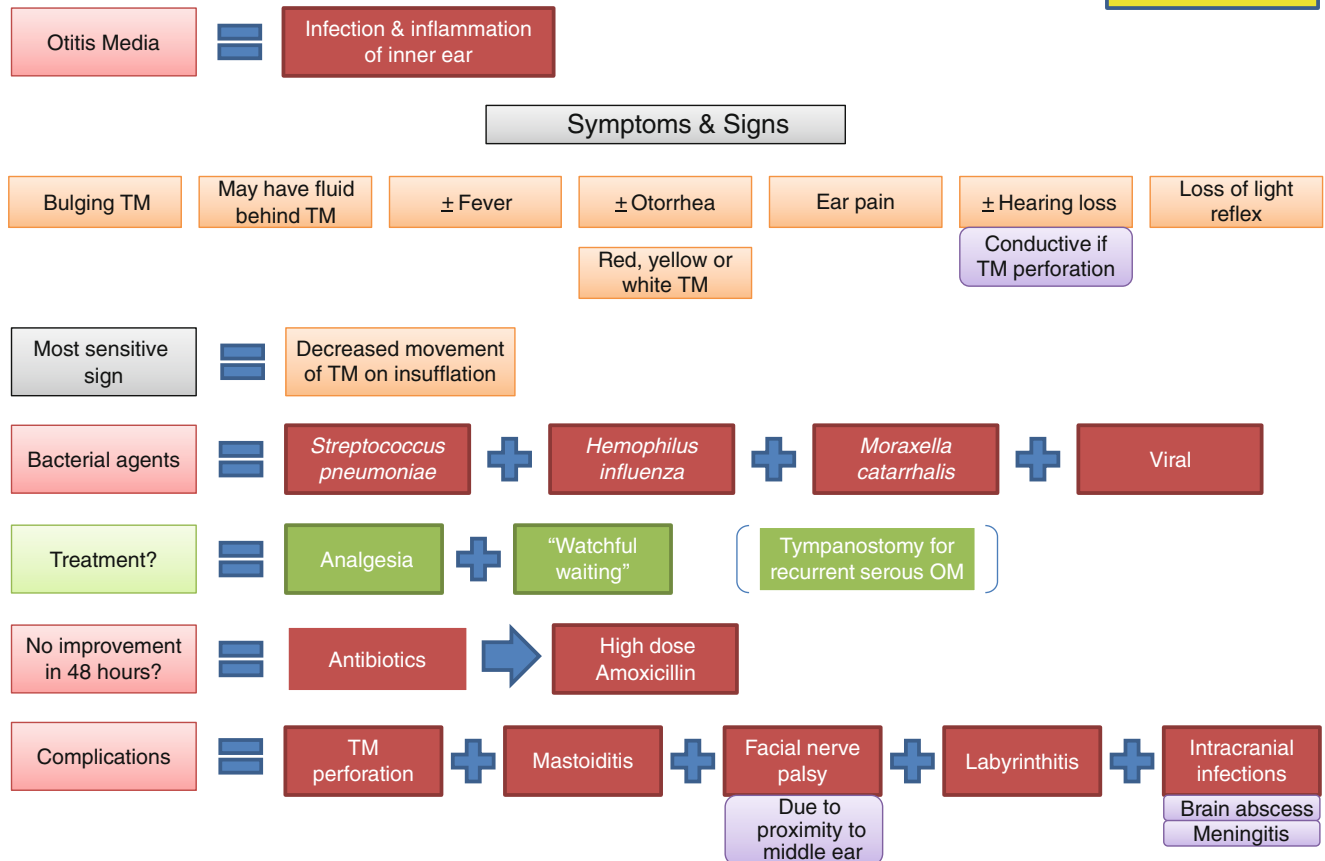
Malignant Otitis Externa (MOE)



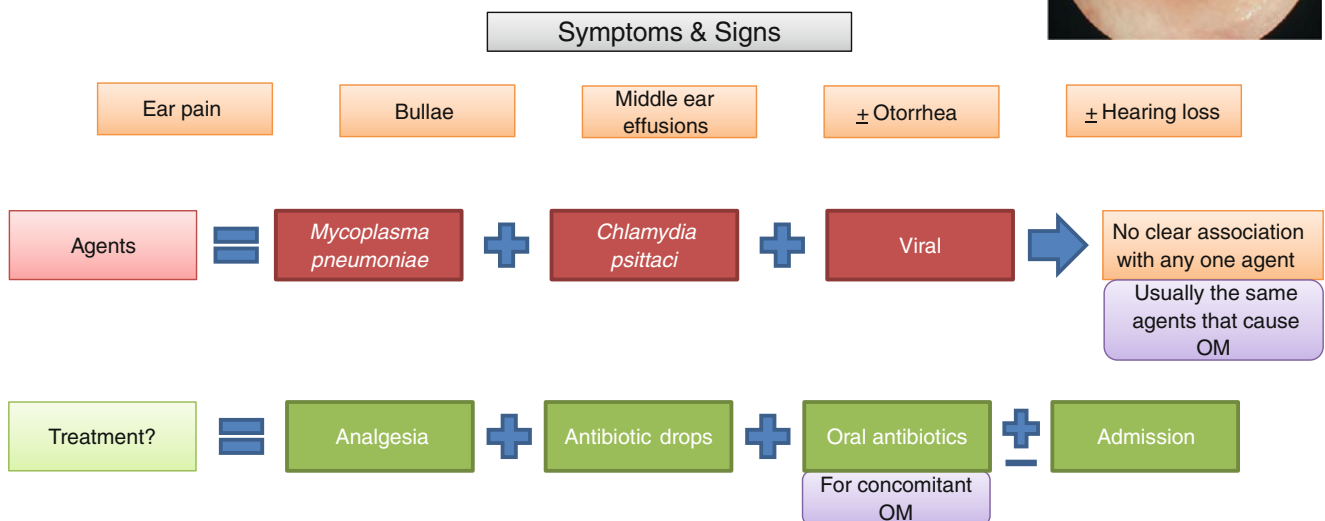
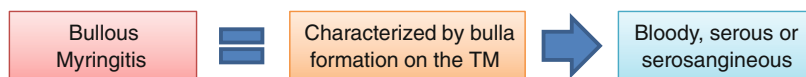
Signs and Symptoms of Malignant Otitis Externa

Otitis Media (OM)

PEDIATRICS



Bullous Myringitis

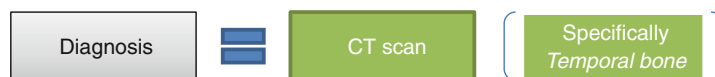


Top right image (Reprinted from Önerci TM. Acute otitis media. In: Önerci TM, editors. Diagnosis in otorhinolaryngology: an illustrated guide. Heidelberg: Springer Verlag; 2010. p. 28–33. With permission from Springer Verlag)

Acute Mastoiditis

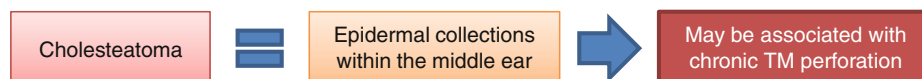


Symptoms & Signs

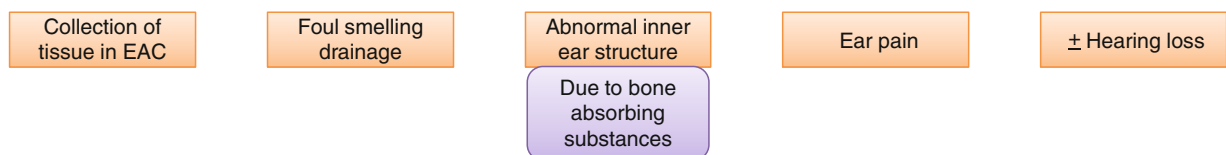


Top right image (Reprinted from Önerci TM. Complications of otitis media. In: Önerci TM, editors. Diagnosis in otorhinolaryngology: an illustrated guide. Heidelberg: Springer Verlag; 2010. p. 43–4. With permission from Springer Verlag)

Cholesteatoma

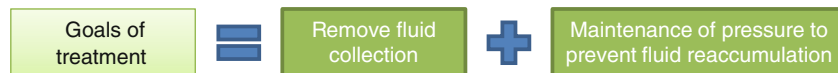
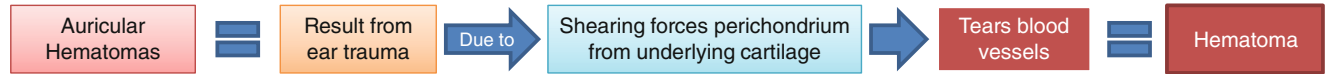


Symptoms & Signs



Ear Trauma

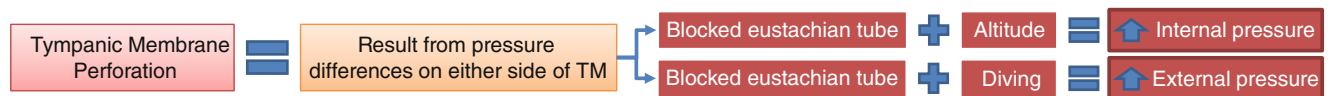
Auricular Hematoma



Cauliflower Ear



Tympanic Membrane Perforation



Symptoms & Signs

Ear pain

± Bloody
otorrhea

± Vertigo

± Tinnitus

Conductive
hearing loss

Tympanic Membrane Perforation = Most heal spontaneously

Treatment

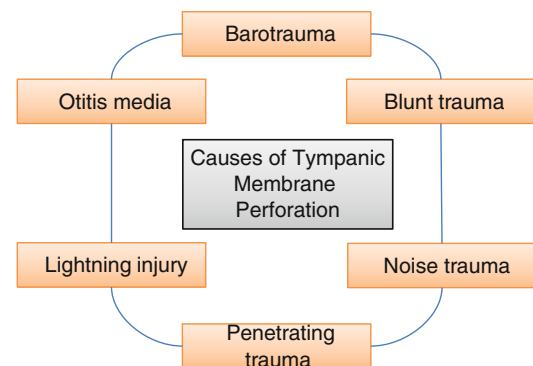
Antibiotics not
neededUnless caused by infection
or forceful water entry

No water in ear

Early Referral
(<24 hours)Penetrating
traumaPosterior
perforationLate Referral
(>24 hours)

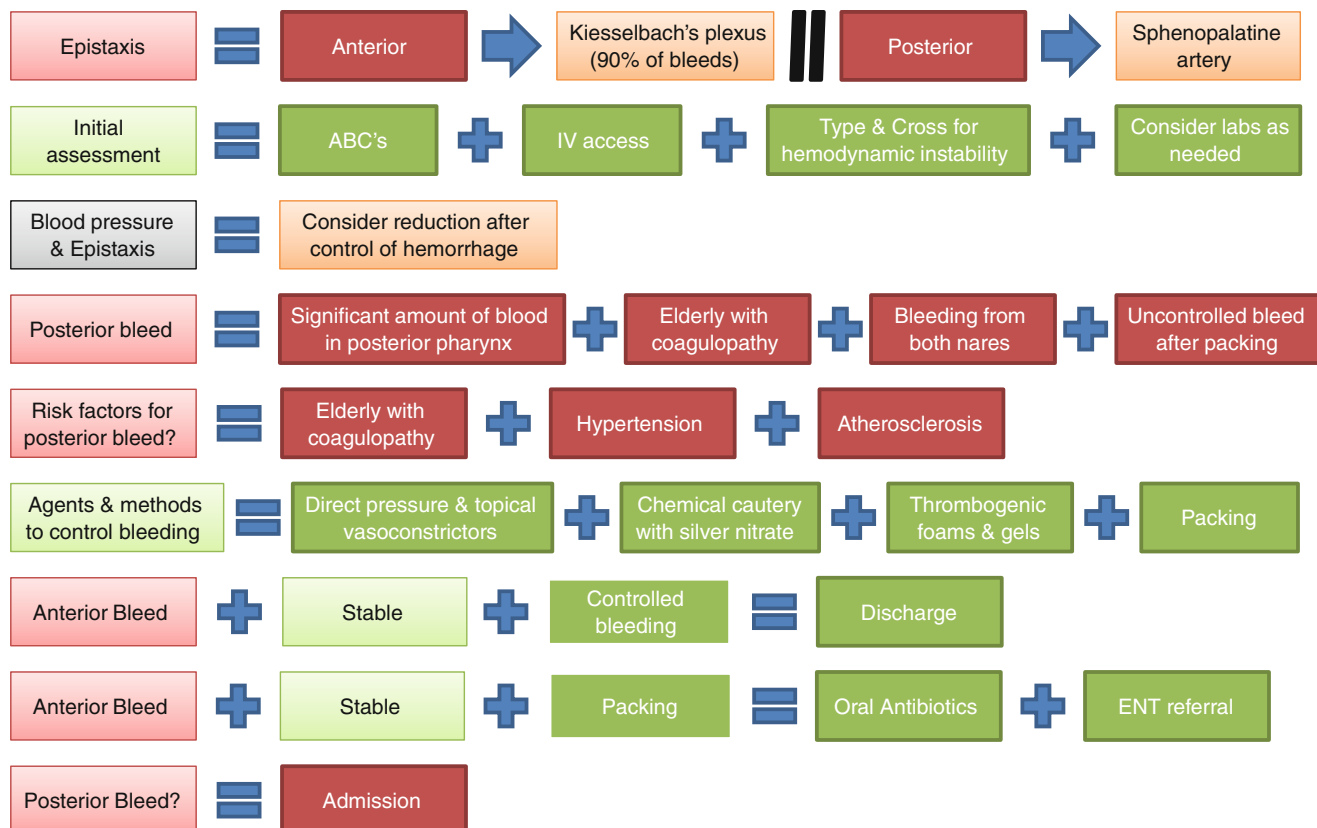
Blunt trauma

Noise trauma

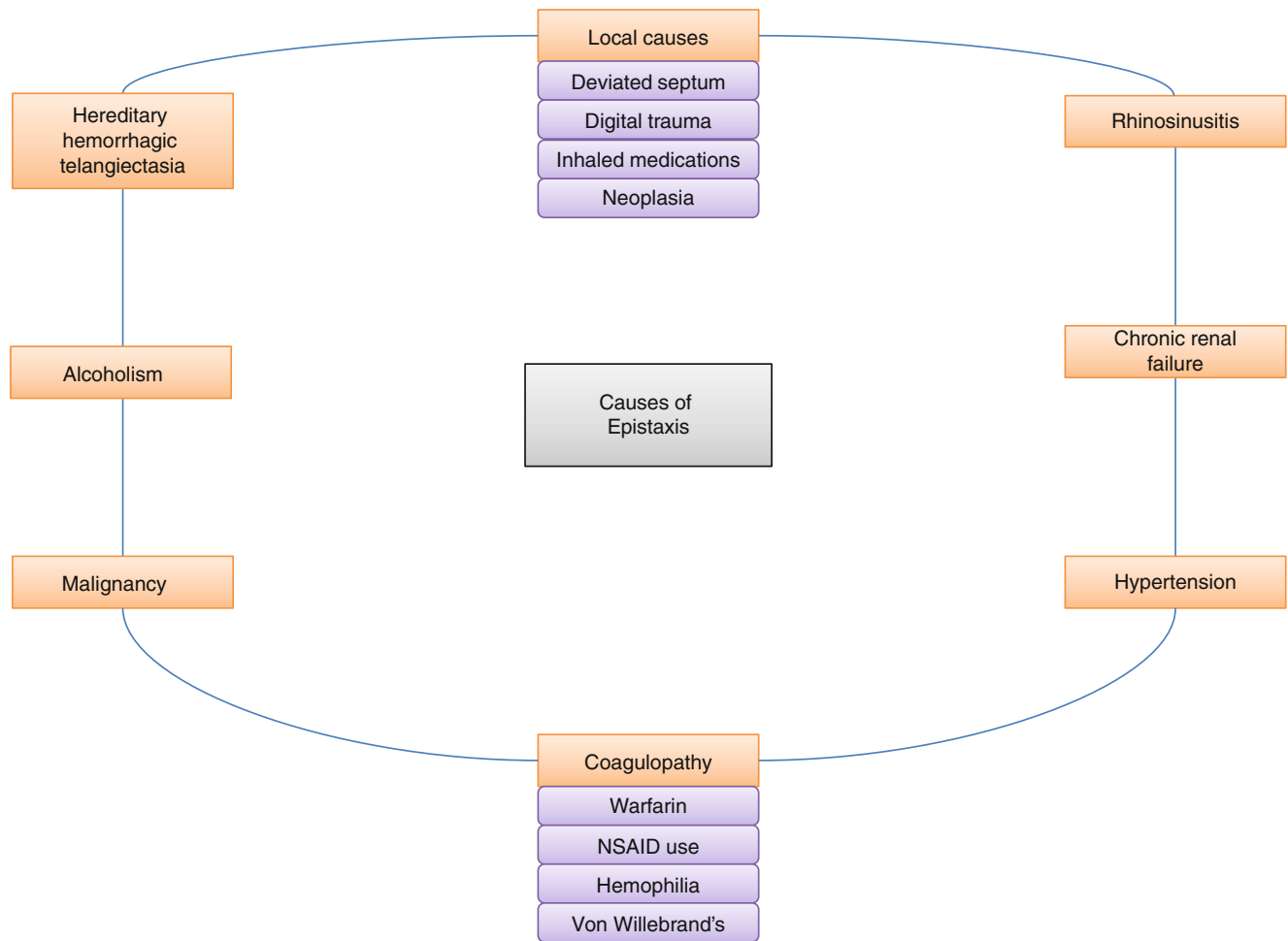


Nose

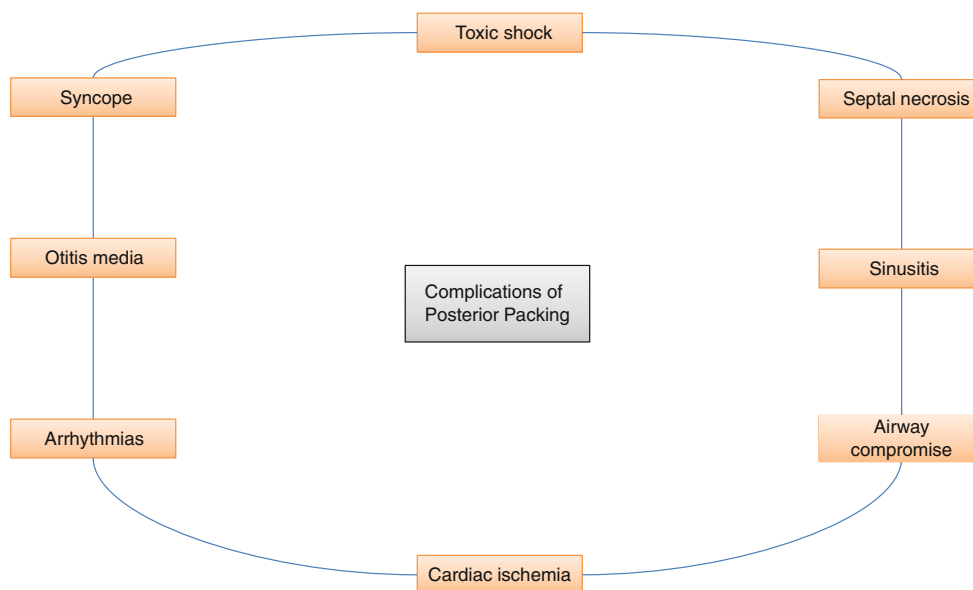
Epistaxis



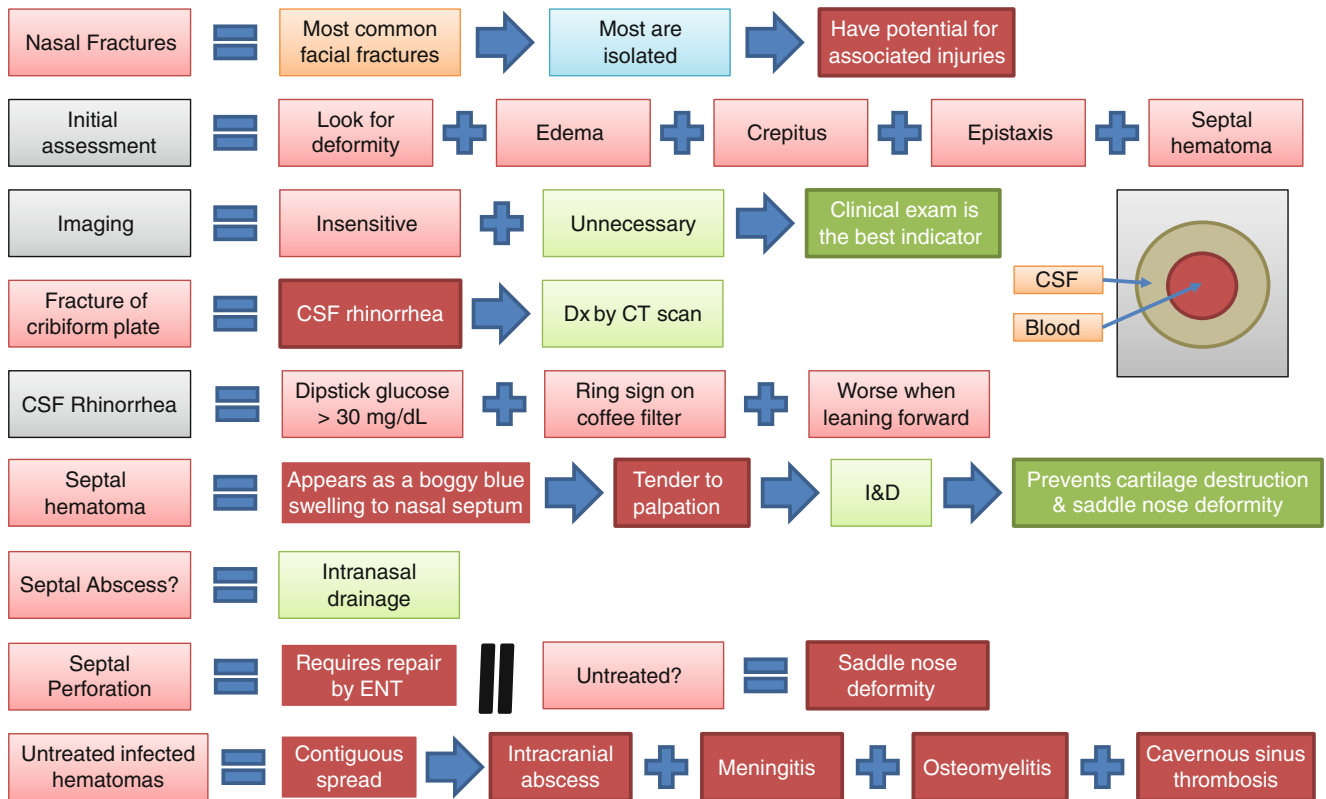
Causes of Epistaxis



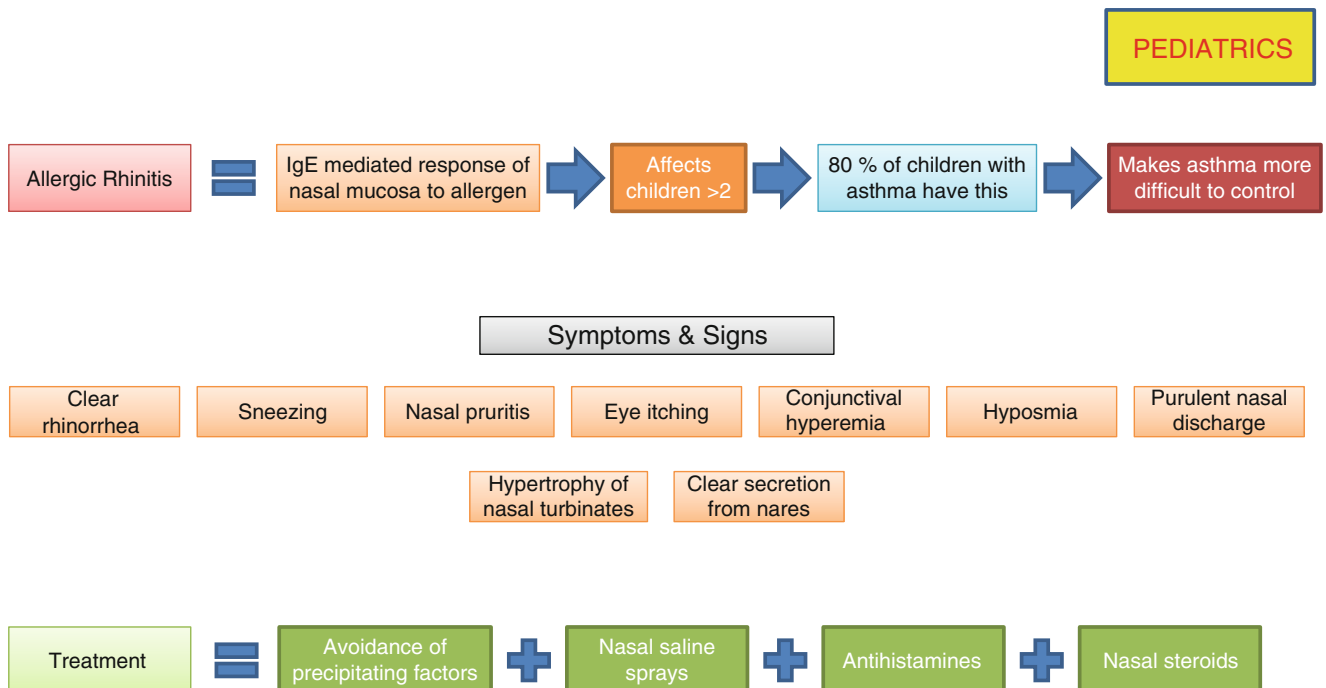
Complications of Posterior Nasal Packing



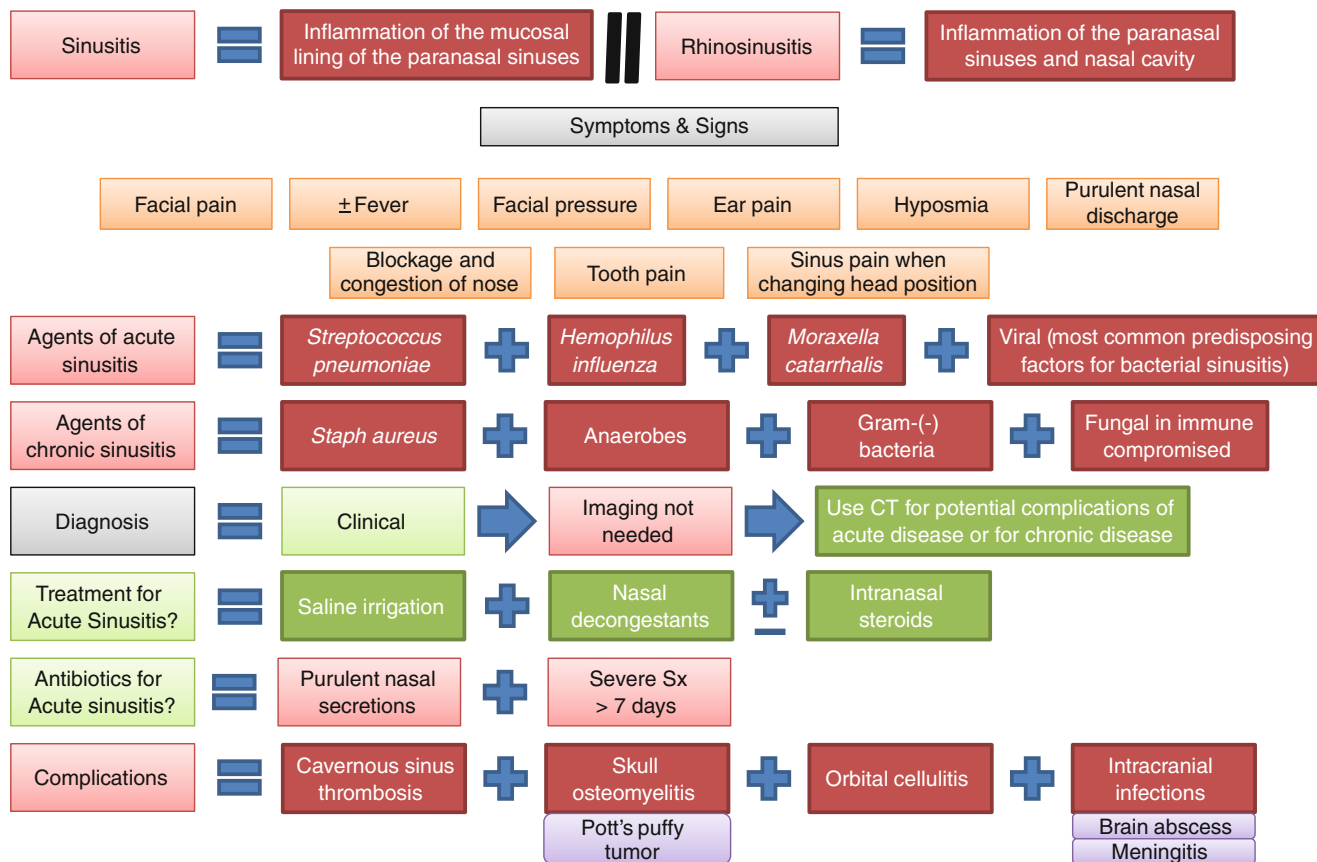
Nasal Fractures



Allergic Rhinitis



Sinusitis – Introduction



Sinusitis

PEDIATRICS

Sinusitis in children = Commonly involves the ethmoid & maxillary sinuses

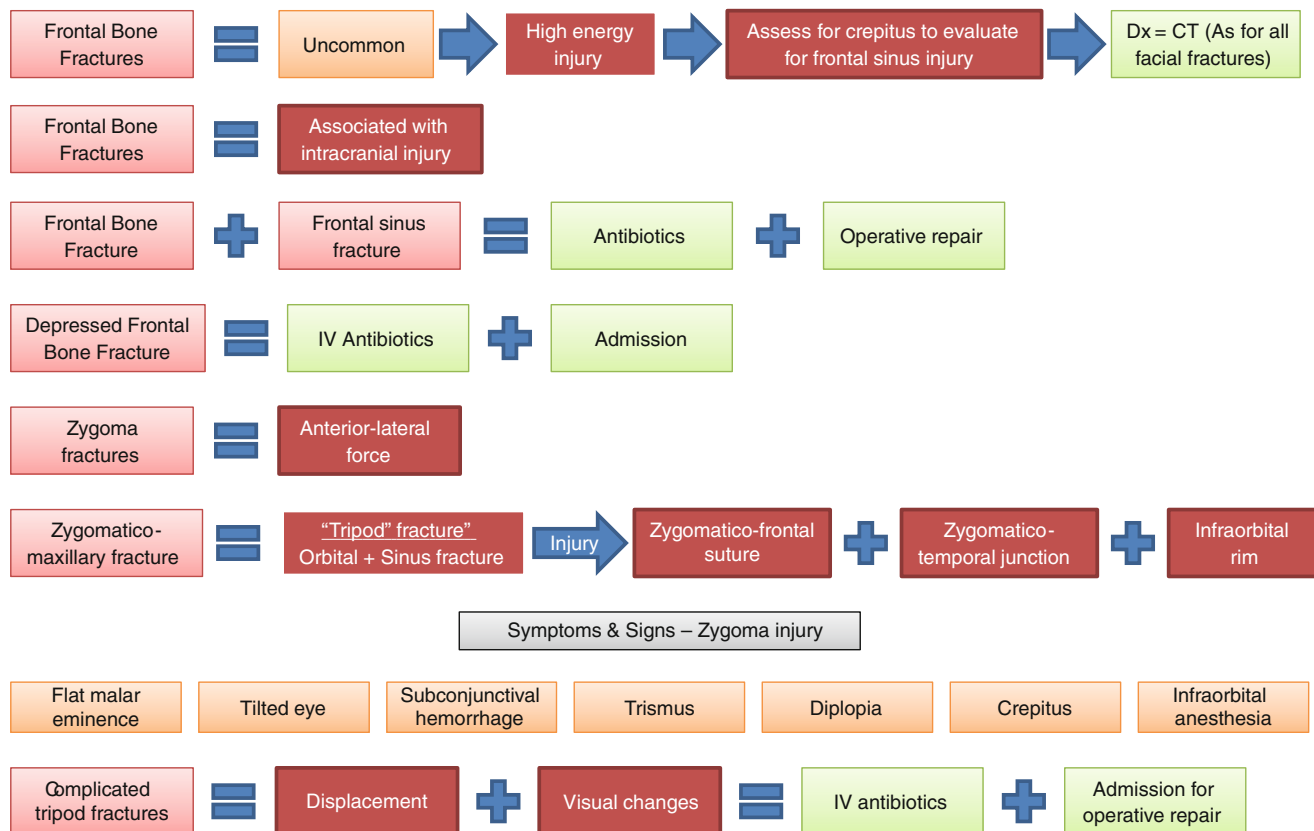
Sphenoid sinus = Form at 3–5 years of age

Frontal sinus = Does not appear until 7–8 years of age

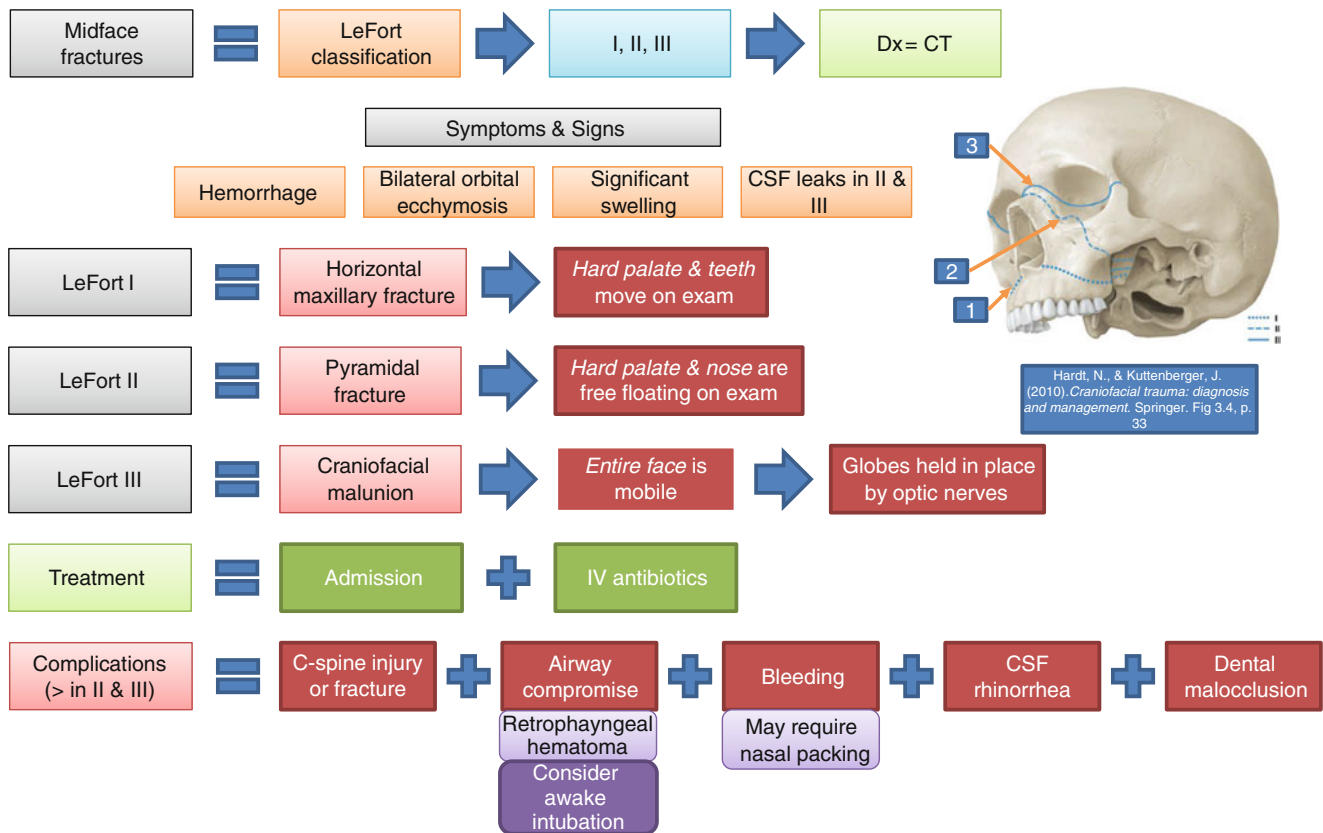
Chronic sinusitis = > 90 days → Treat for anaerobes as well → Give for 4 weeks + Refer to ENT

Facial Fractures

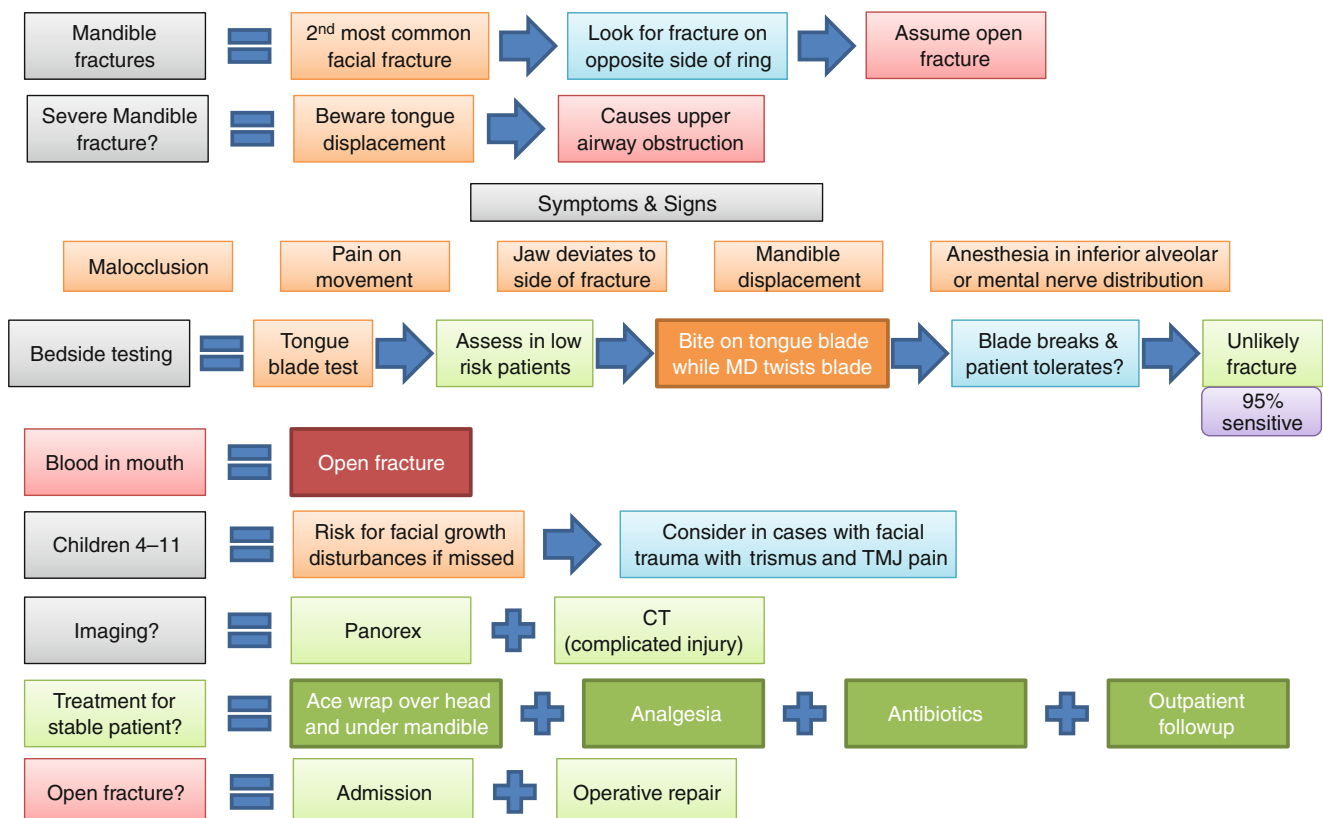
Frontal and Zygoma Fractures



Midface Fractures

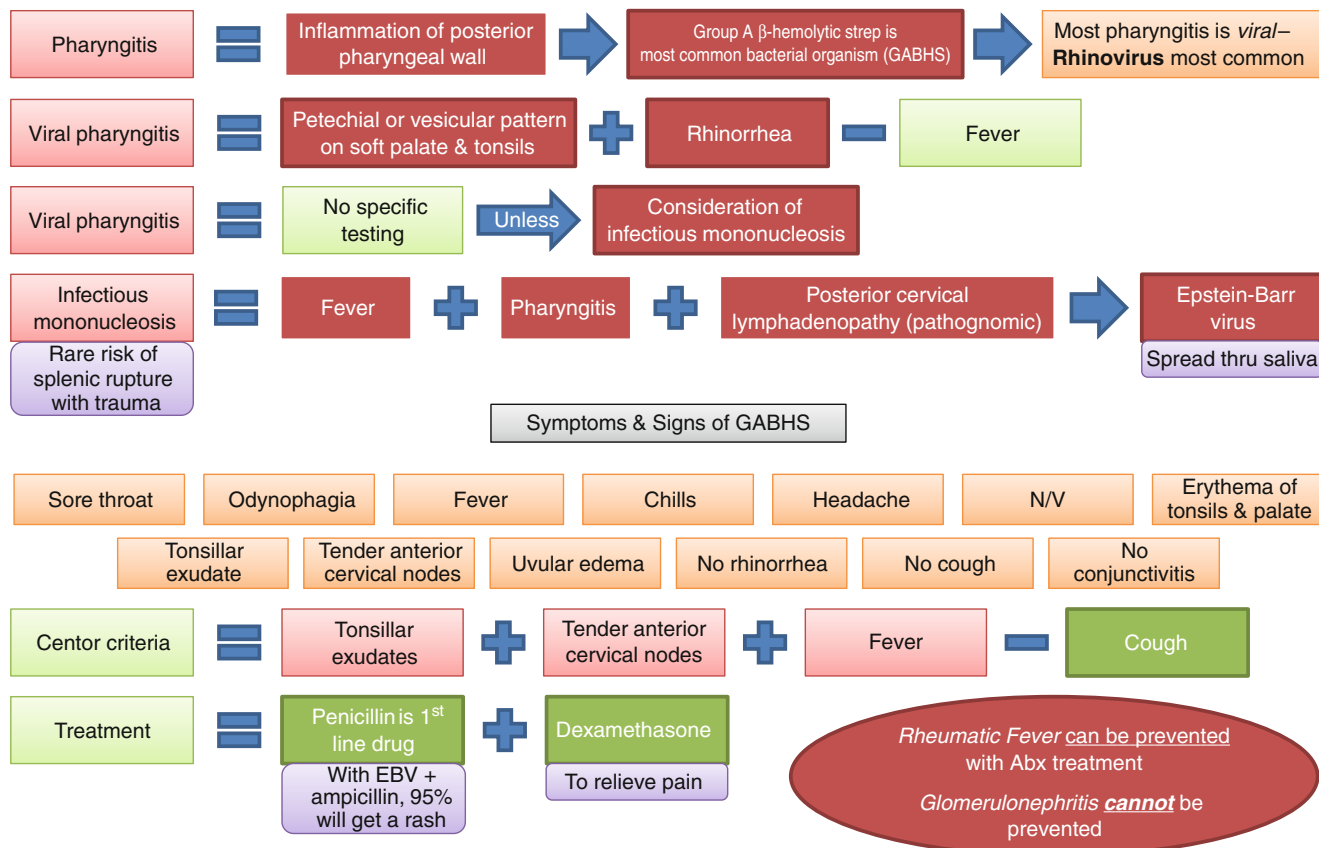


Mandible Fractures

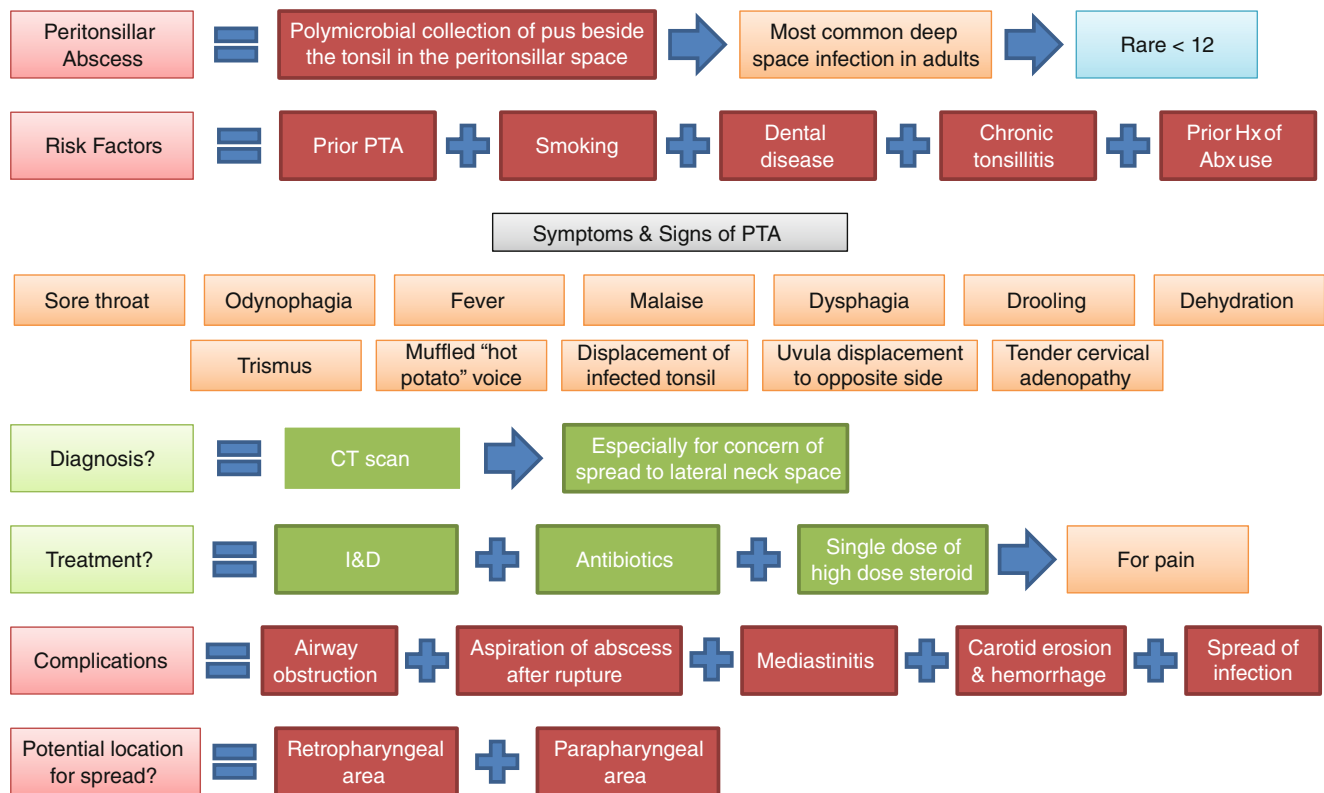


Throat/Neck/Upper Airway Infections

Pharyngitis and Tonsillitis

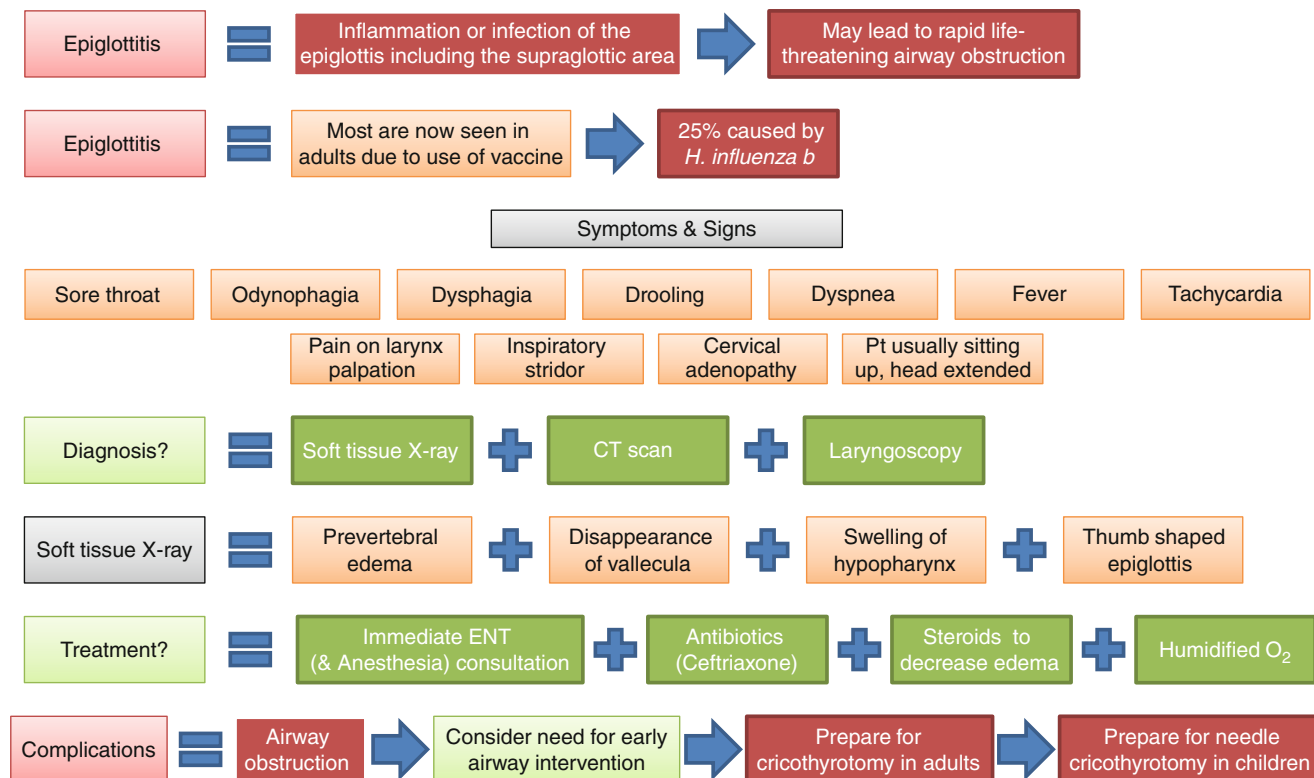


Peritonsillar Abscess (PTA)



Epiglottitis

PEDIATRICS



Retropharyngeal Abscess

PEDIATRICS

Retropharyngeal Abscess = Deep inflammation or infection behind the posterior pharyngeal wall → In children the primary infection is elsewhere in the head & neck

Retropharyngeal Abscess in adults = In adults, the infection is due to extension from a nearby site → More likely to extend into the mediastinum

Symptoms & Signs

Sore throat

Fever

Torticollis

Dysphagia

Neck pain

Cervical
adenopathy

Neck edema

Odynophagia

Muffled or hoarse voice
("Cri du canard" = duck like voice)

Stridor

Anterior displacement of
posterior pharyngeal wall

Diagnosis?

Soft tissue X-ray

+

CT scan
(Gold standard)

Soft tissue X-ray

=

Protrusion of
retropharyngeal wall

→

Neck flexion may cause
bulge of posterior wall

Treatment?

=

Immediate ENT
consultation

+

Antibiotics

+

IV hydration

+

Surgical
intervention

Complications

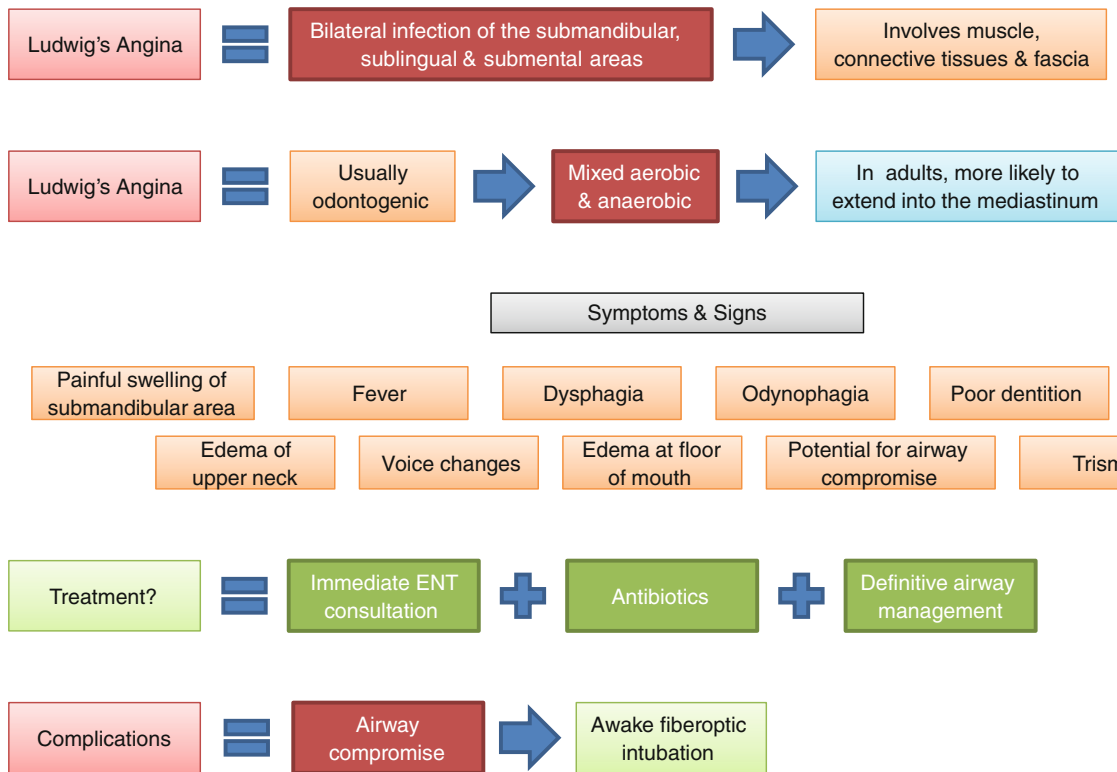
=

Airway
compromise

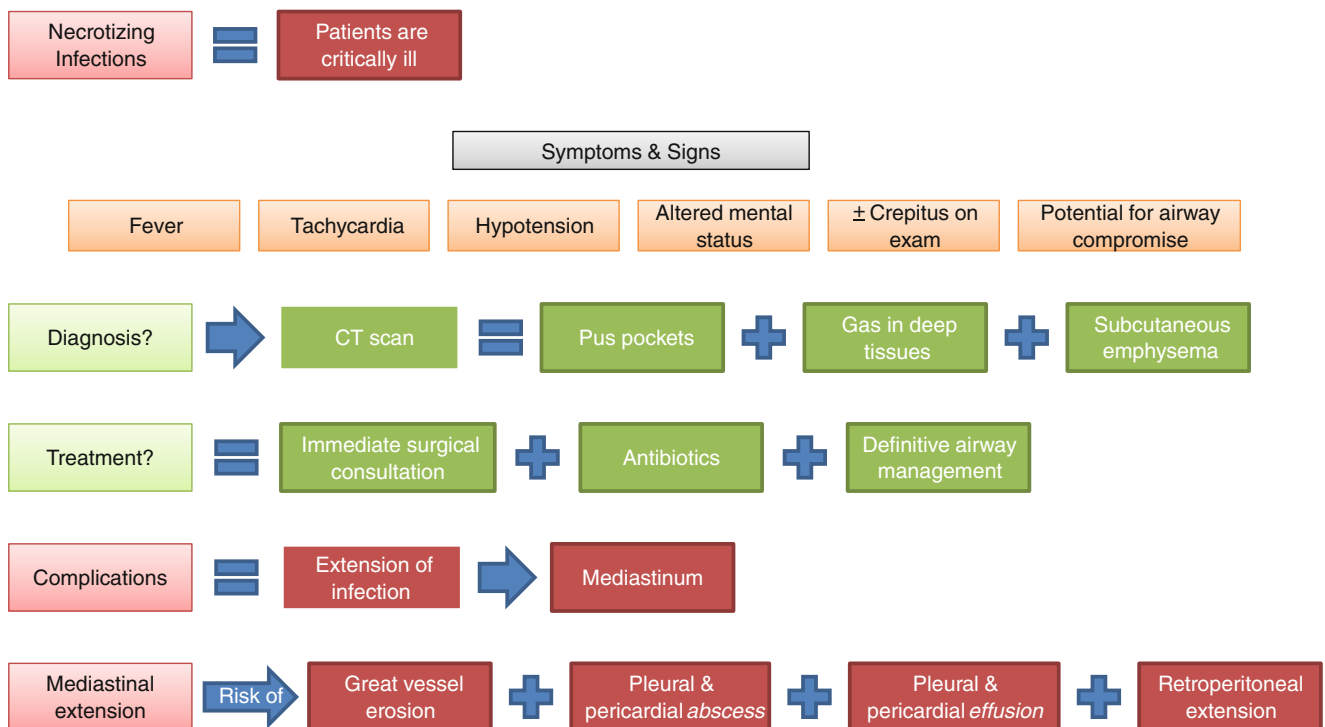
+

Extension into
mediastinum

Ludwig's Angina

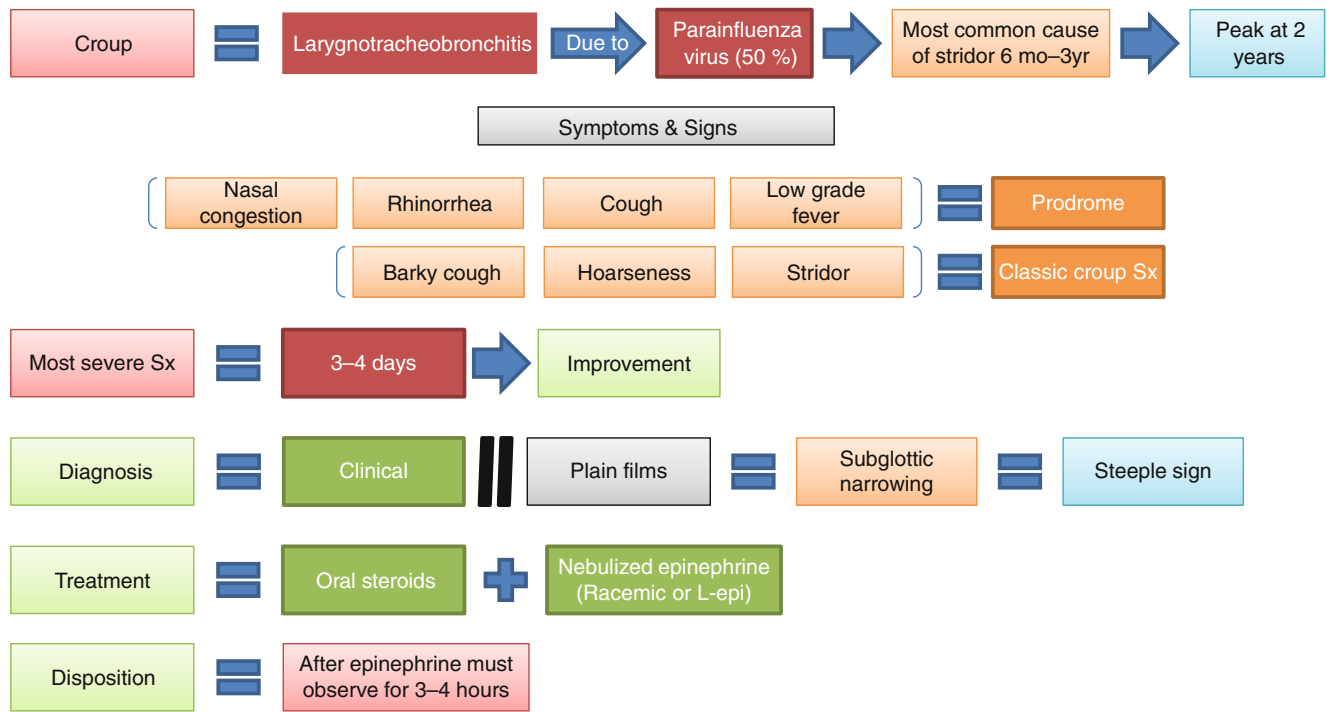


Necrotizing Infections



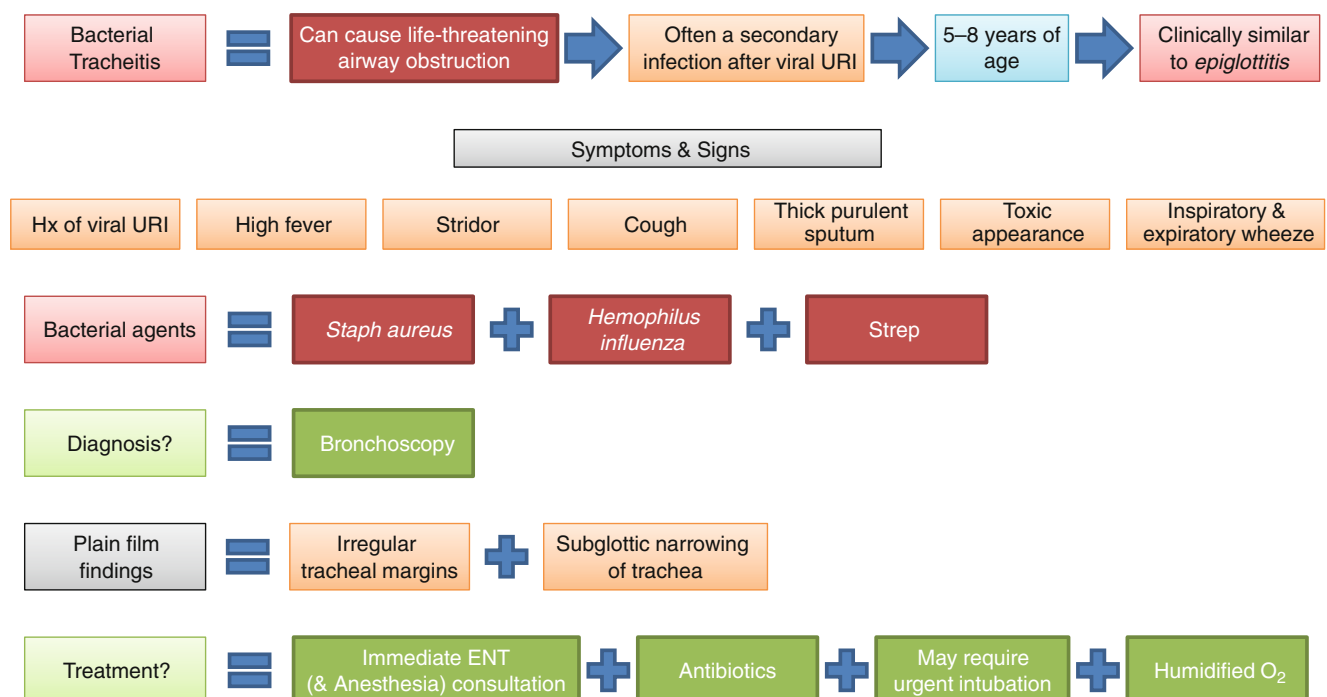
Croup

PEDIATRICS



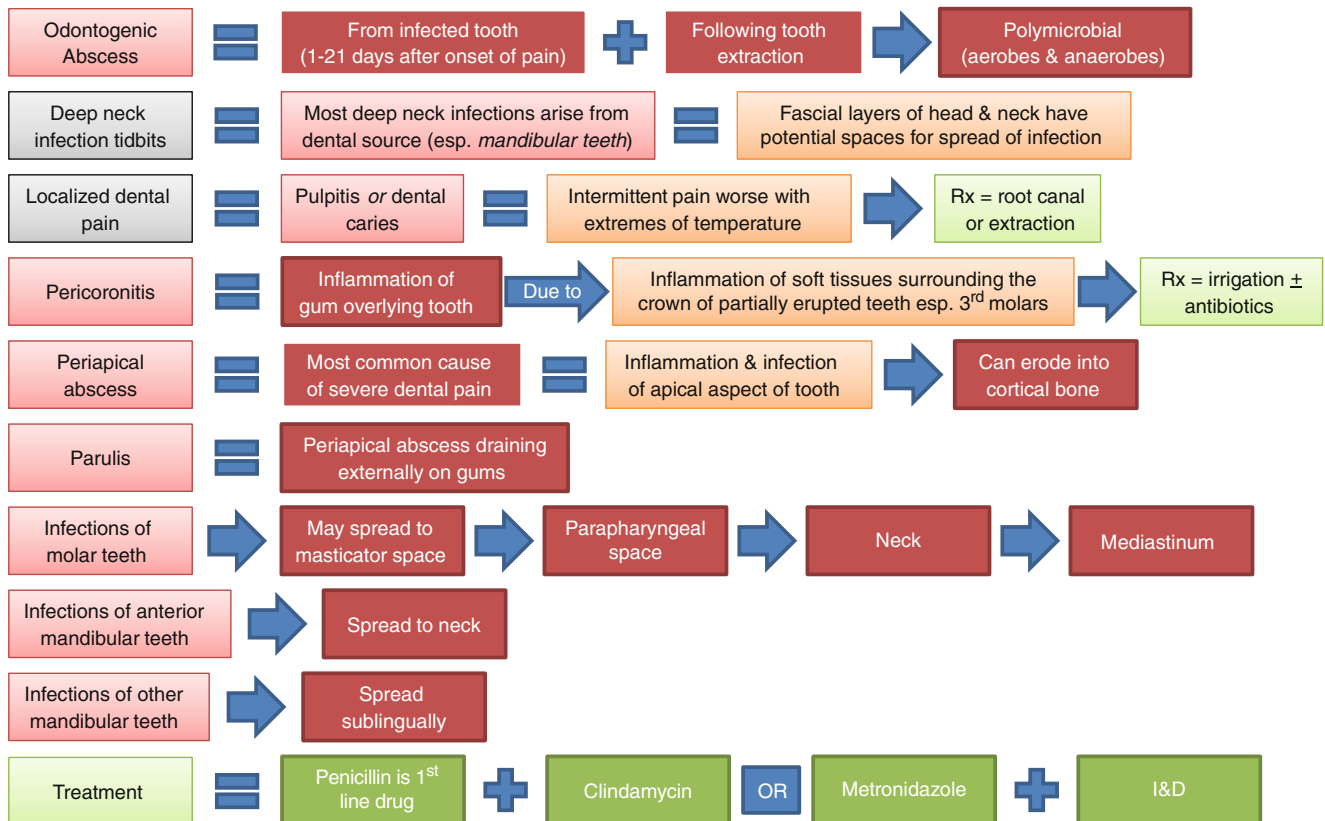
Bacterial Tracheitis

PEDIATRICS

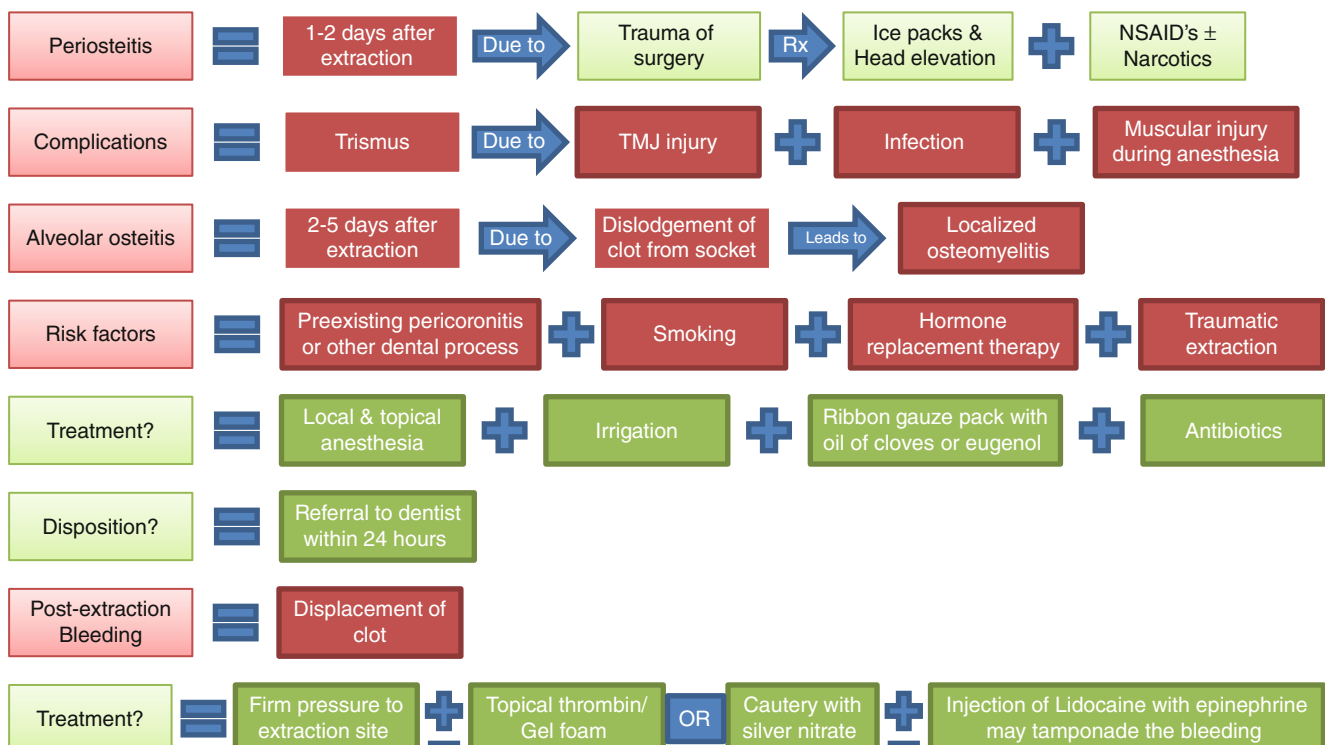


Dental Emergencies

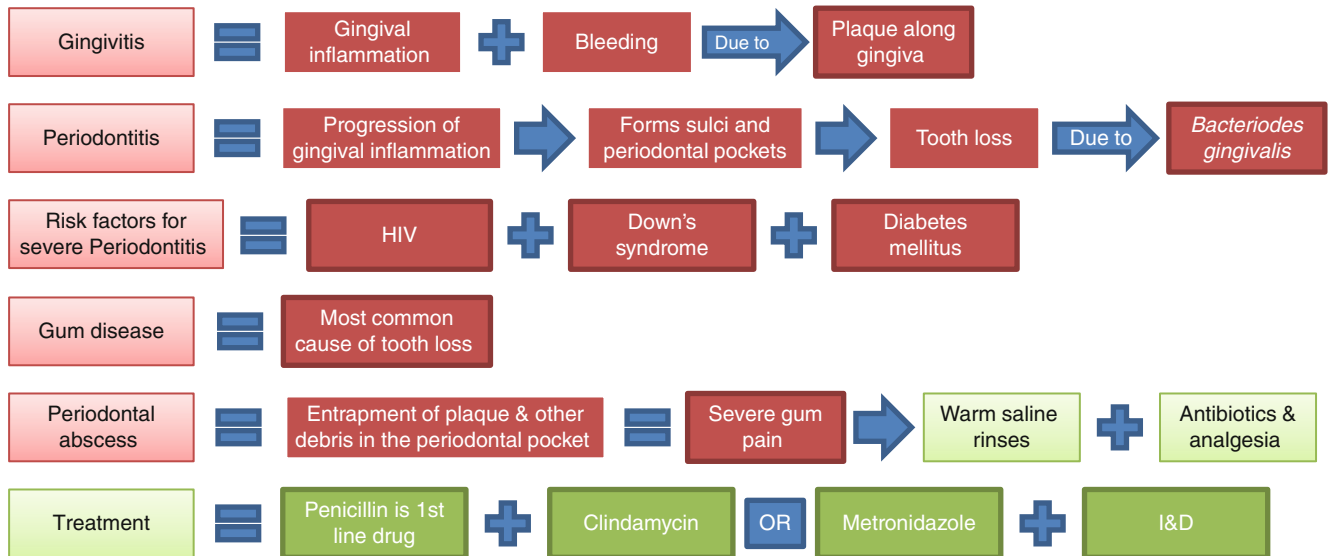
Odontogenic Infections



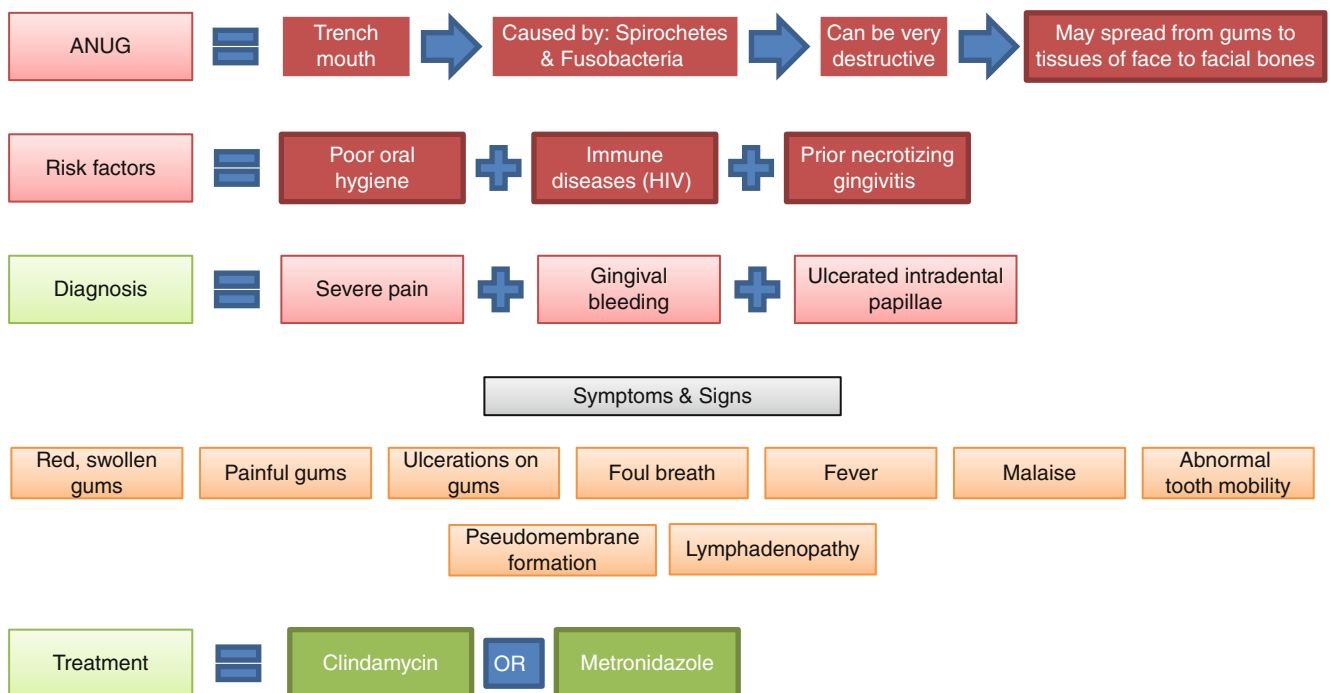
Periostitis and Alveolar Osteitis and Post-extraction Bleeding



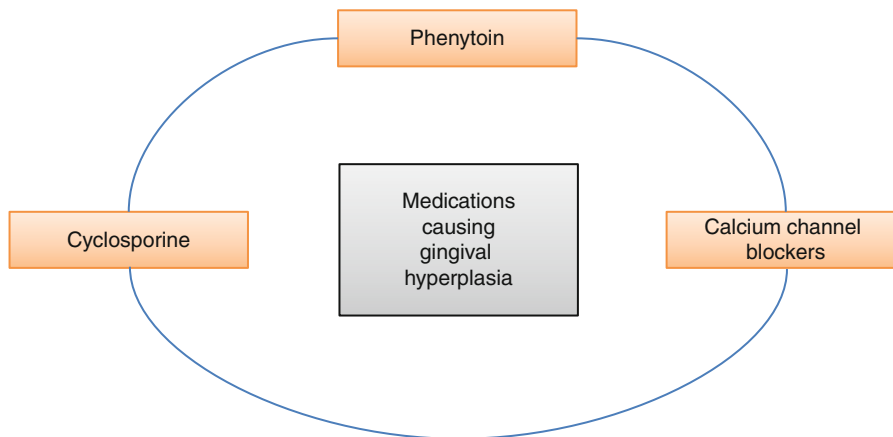
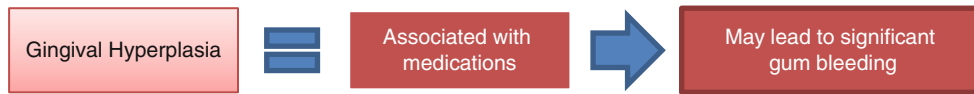
Periodontal Pathology



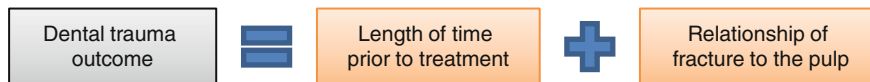
Acute Necrotizing Ulcerative Gingivitis (ANUG)



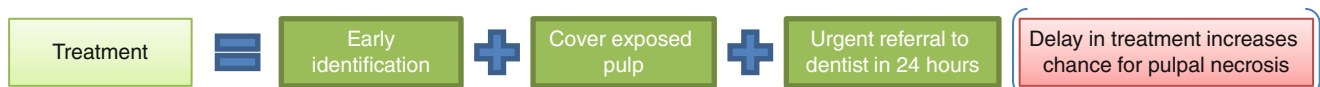
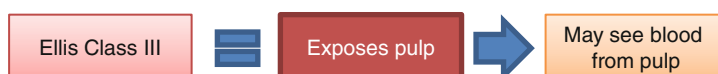
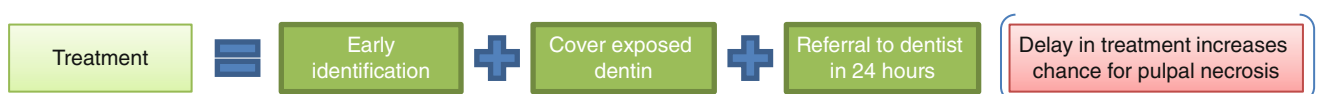
Gingival Hyperplasia



Dental Trauma: Introduction



Ellis Fractures



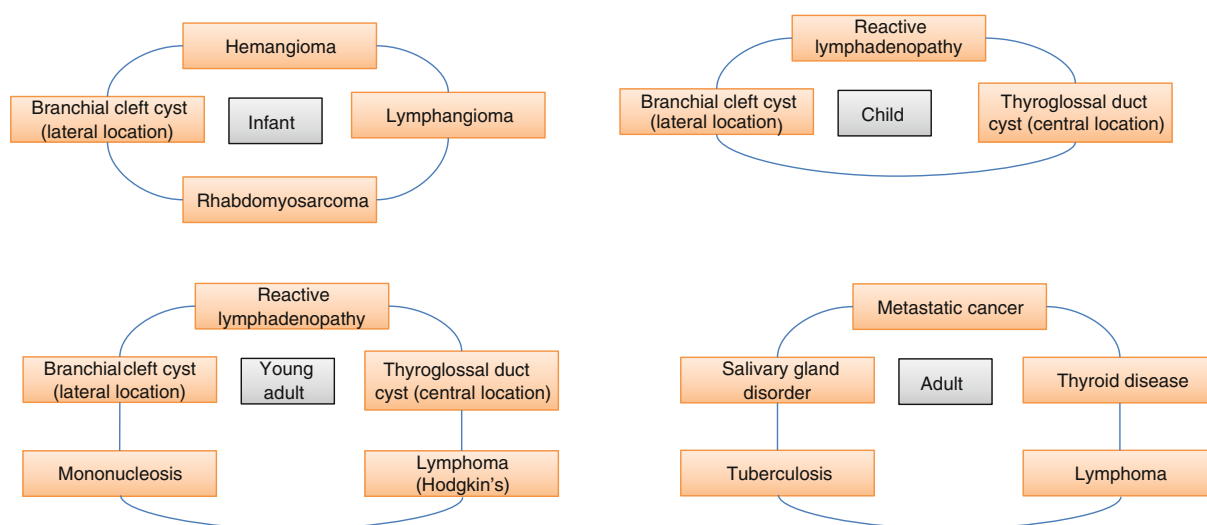
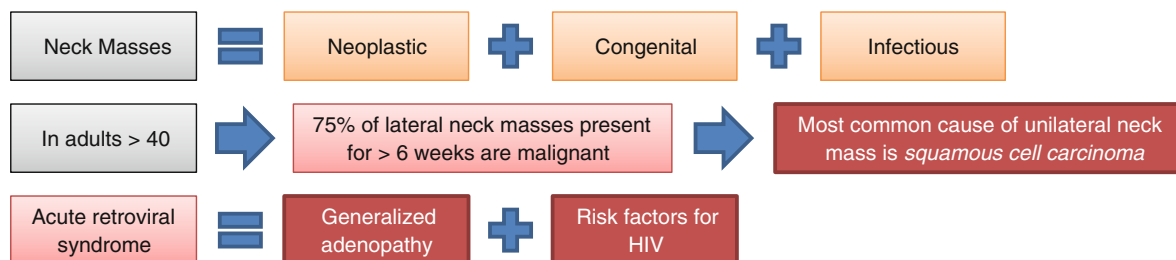
Dental Trauma



Neck Masses

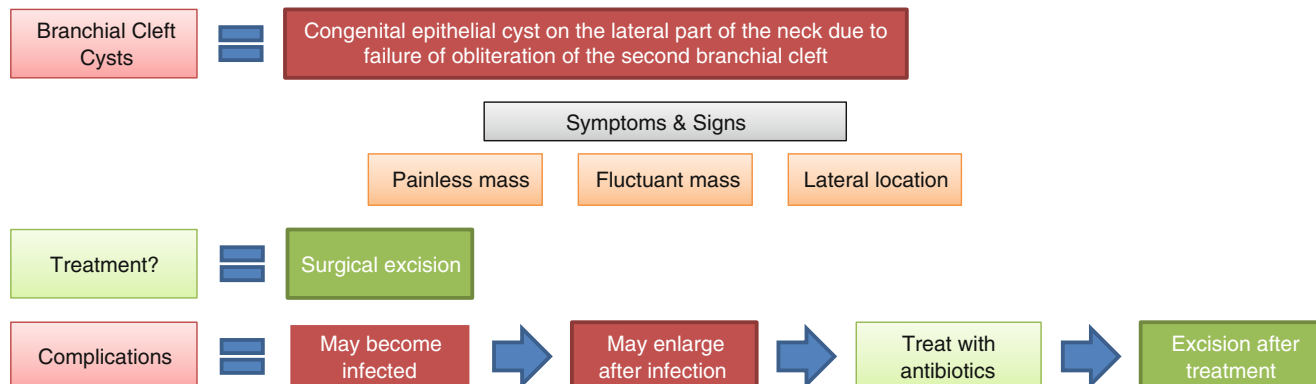
Neck

PEDIATRICS

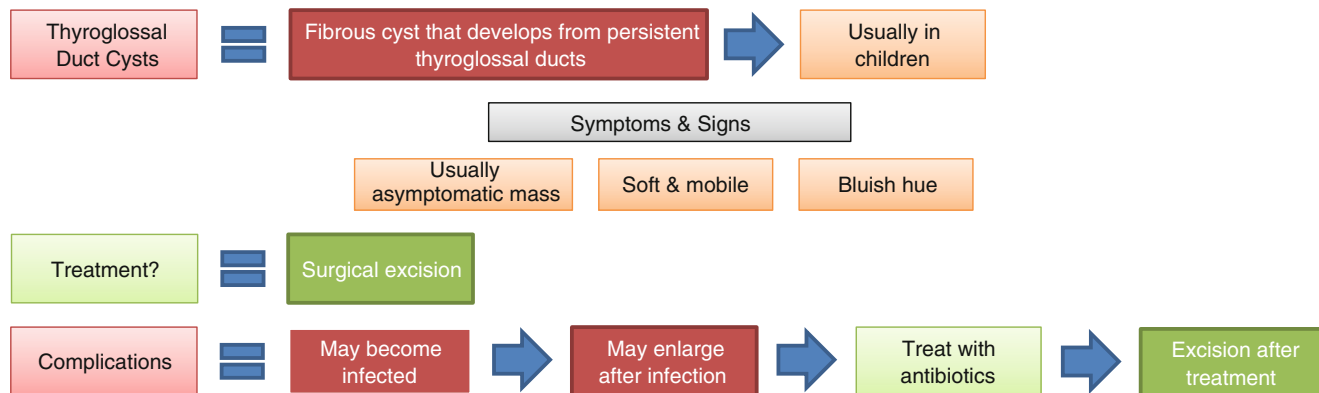


Branchial Cleft Cysts

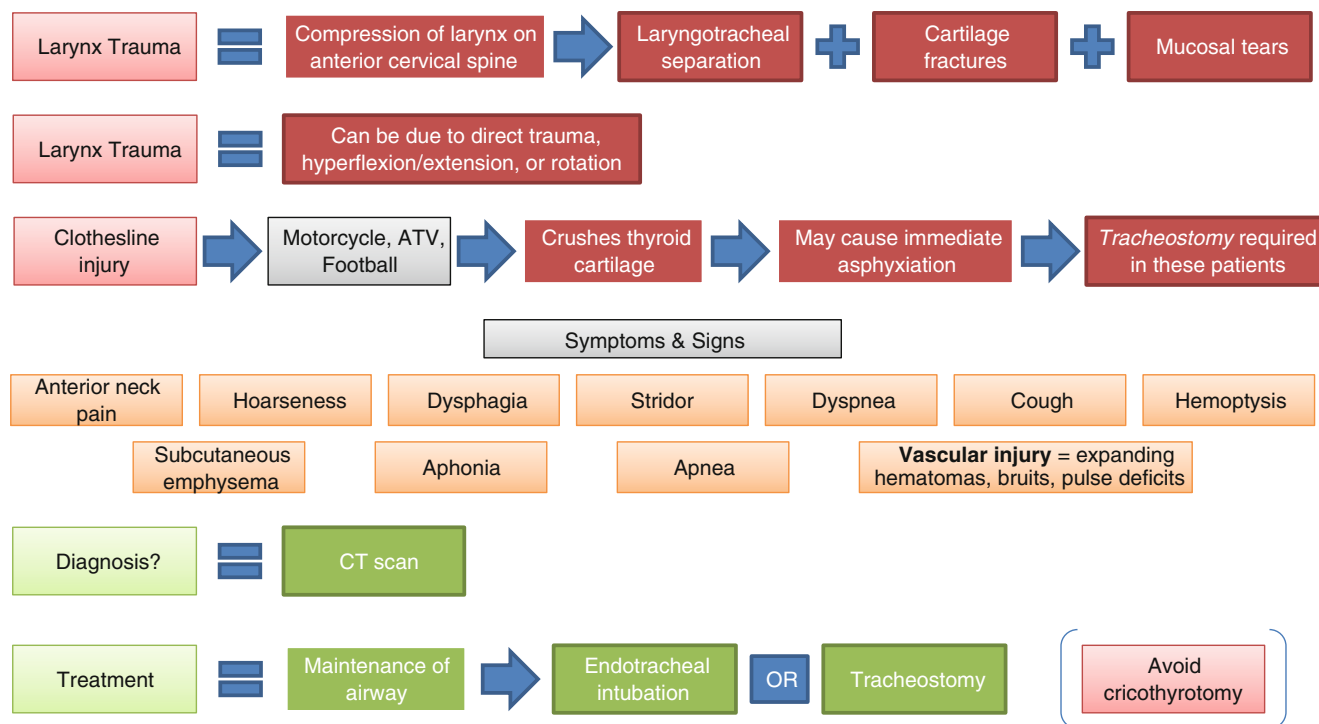
PEDIATRICS



Thyroglossal Duct Cysts

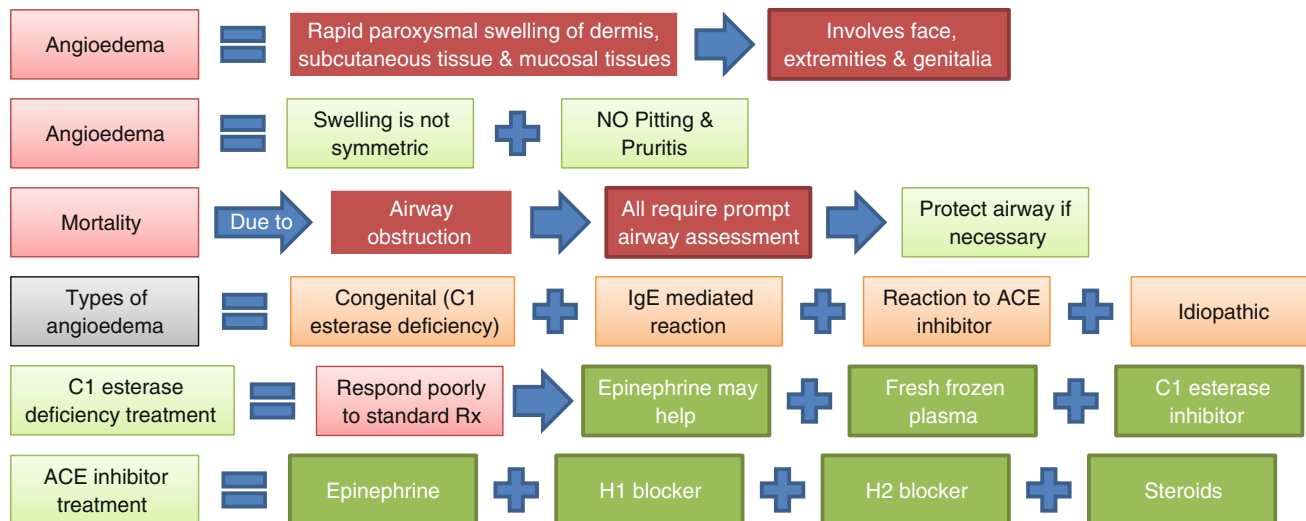
PEDIATRIC


Larynx Trauma

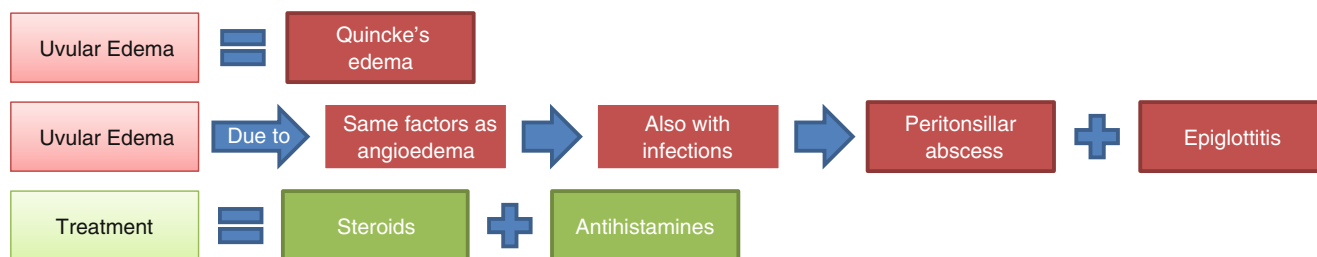


Edema of Upper Airway

Angioedema

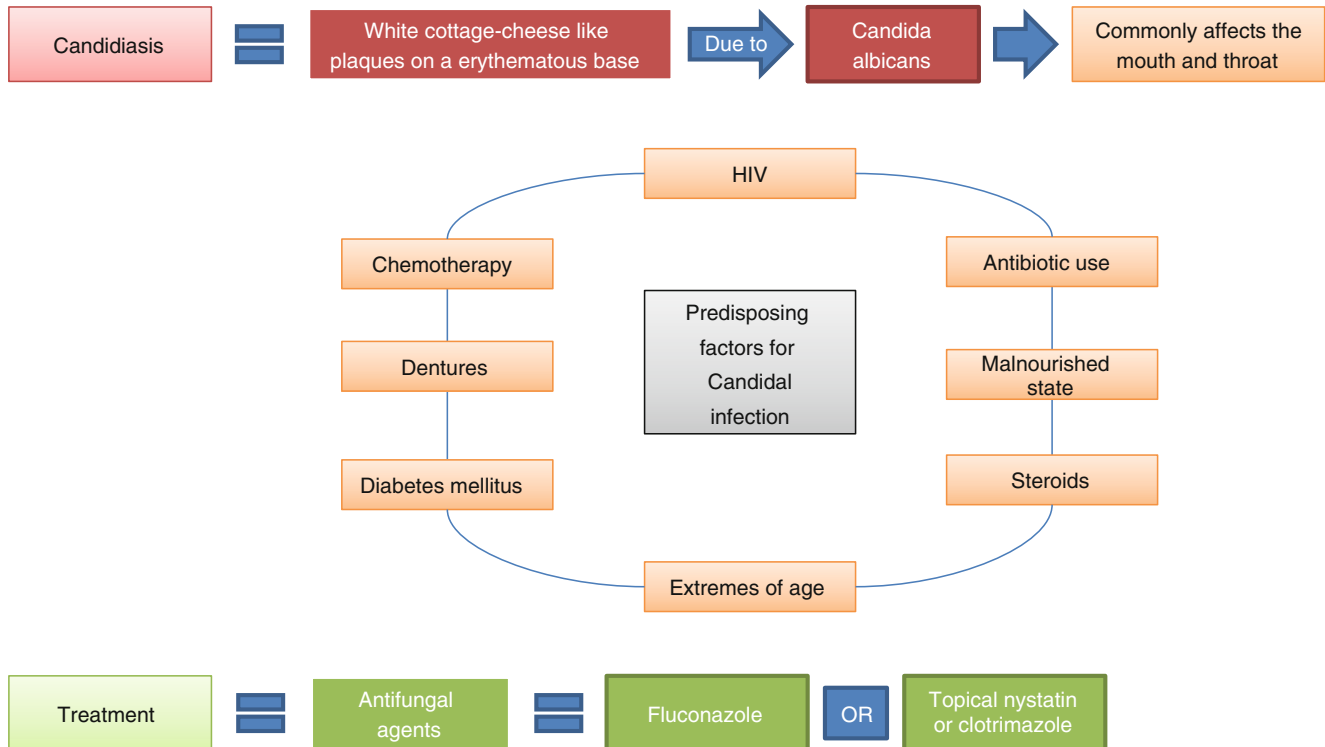


Uvular Edema

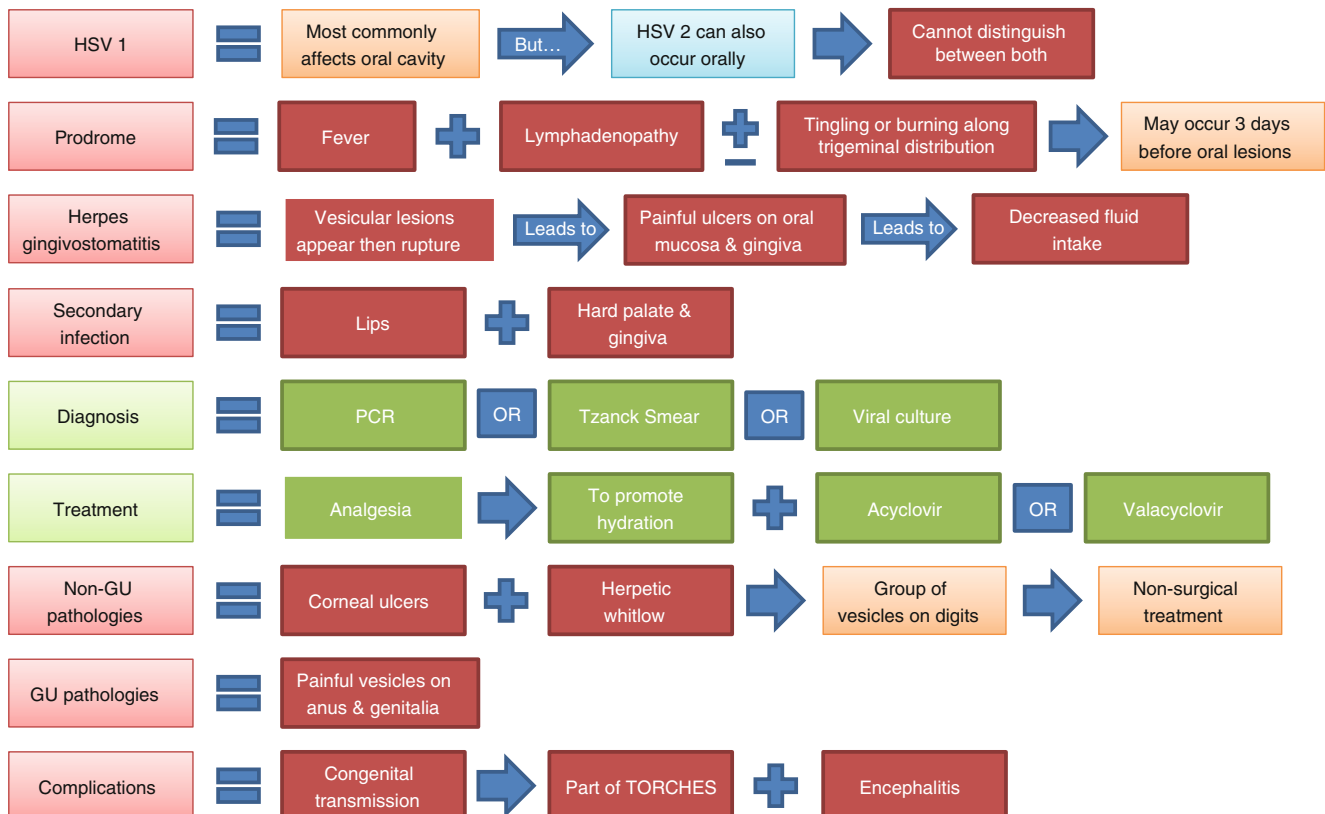


Soft Tissue Lesions

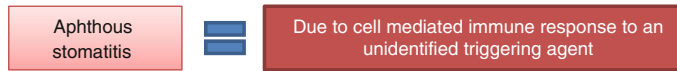
Candidiasis



HSV infections

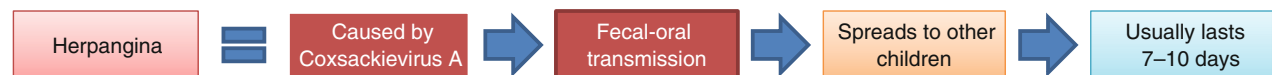


Aphthous Stomatitis



Herpangina

PEDIATRIC



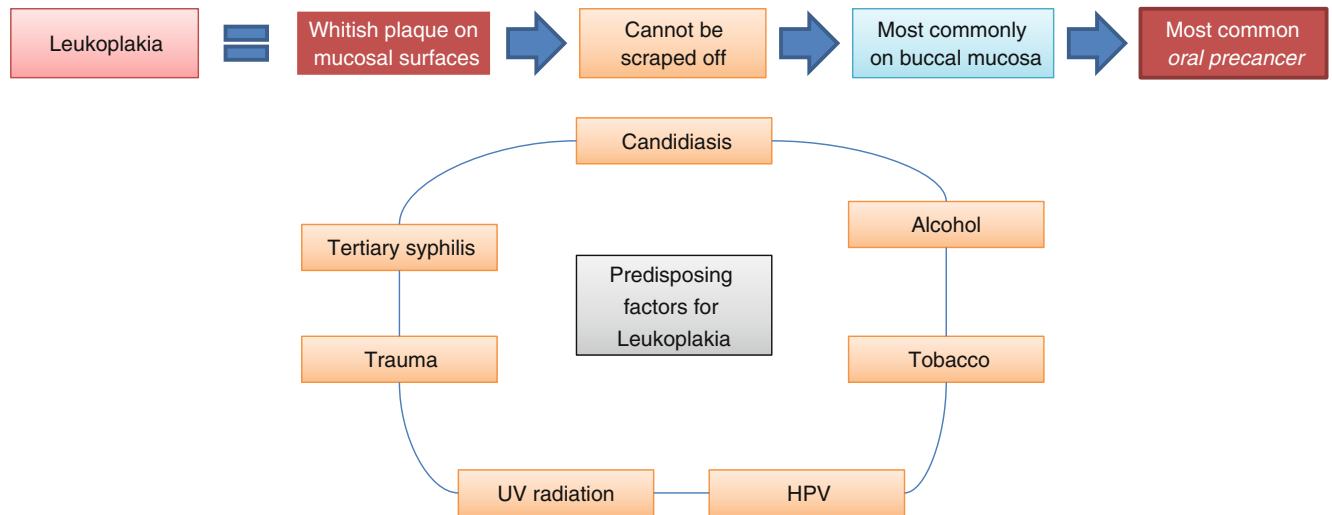
Symptoms & Signs



Distinguished from Herpes gingivostomatitis which does affect gingiva

Intraoral and Tongue Lesions

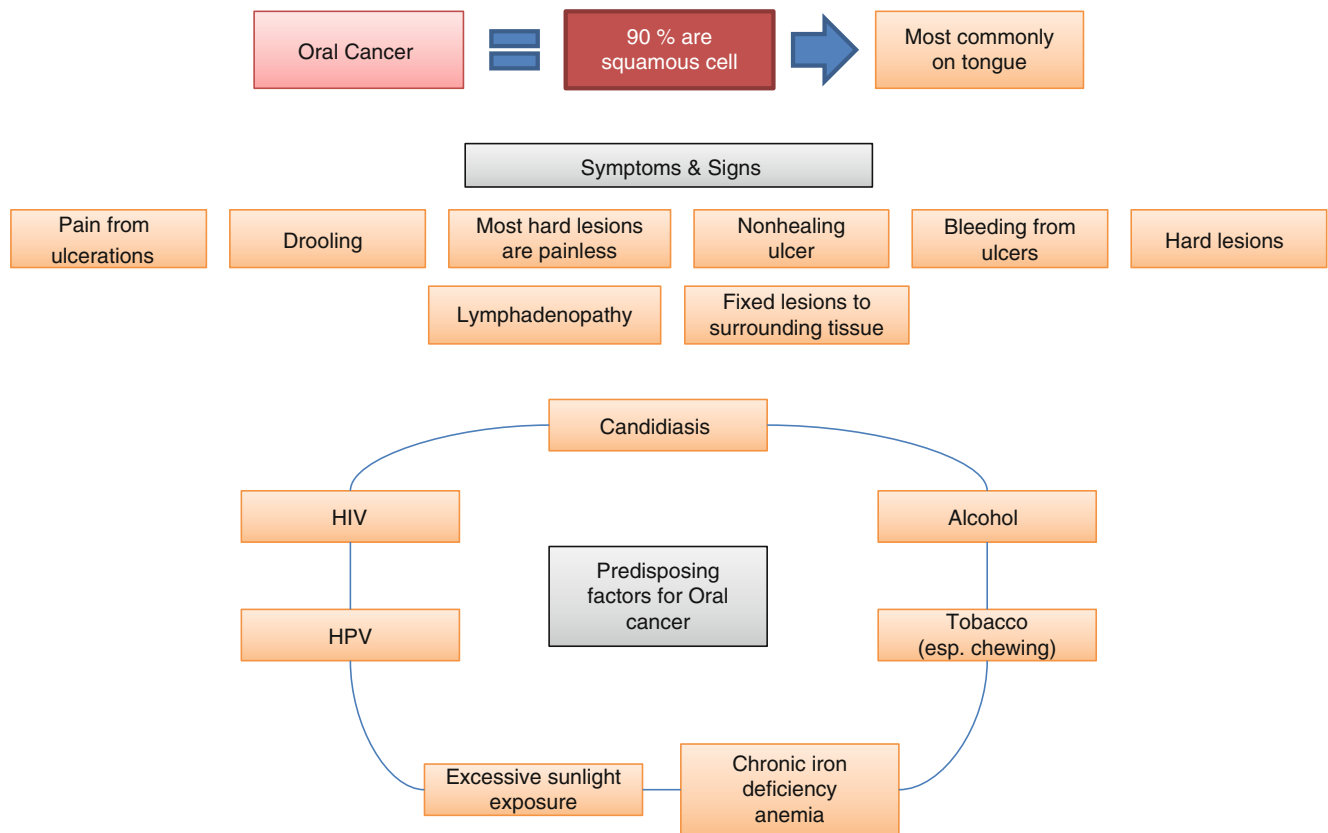
Leukoplakia



Strawberry Tongue



Oral Cancer

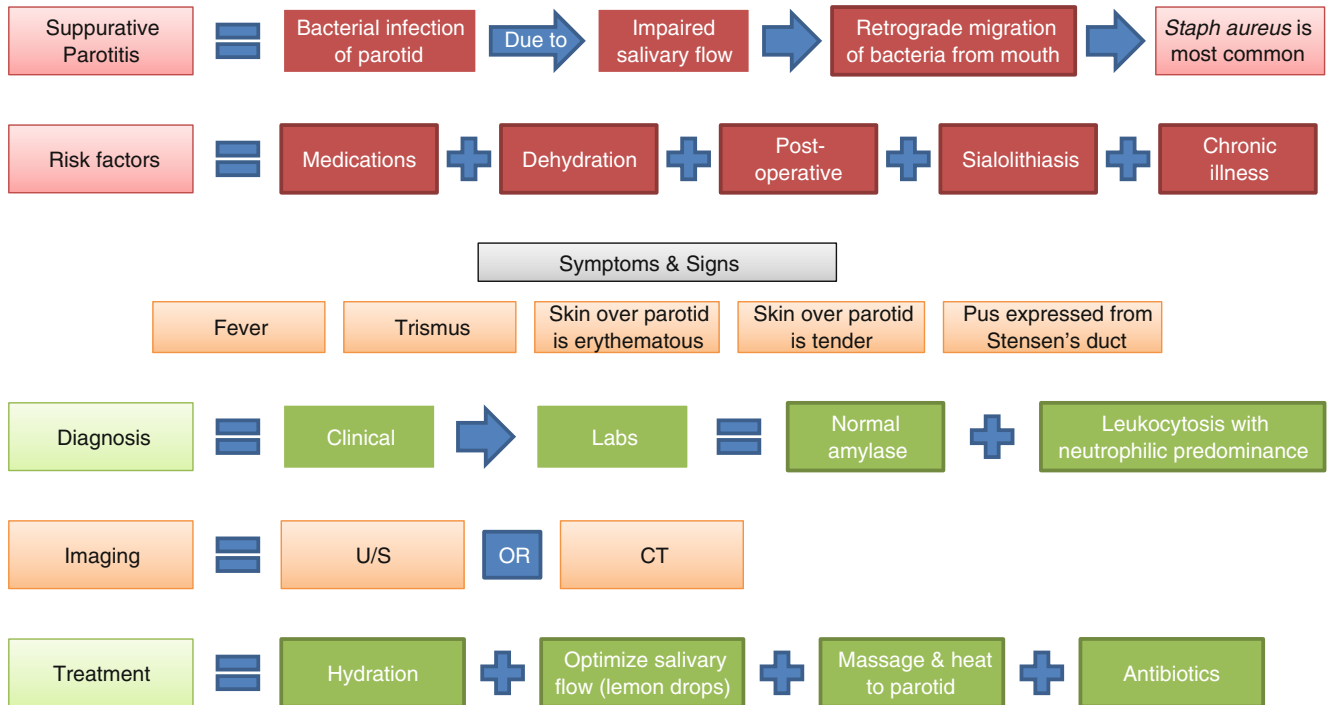


Salivary Gland Disorders

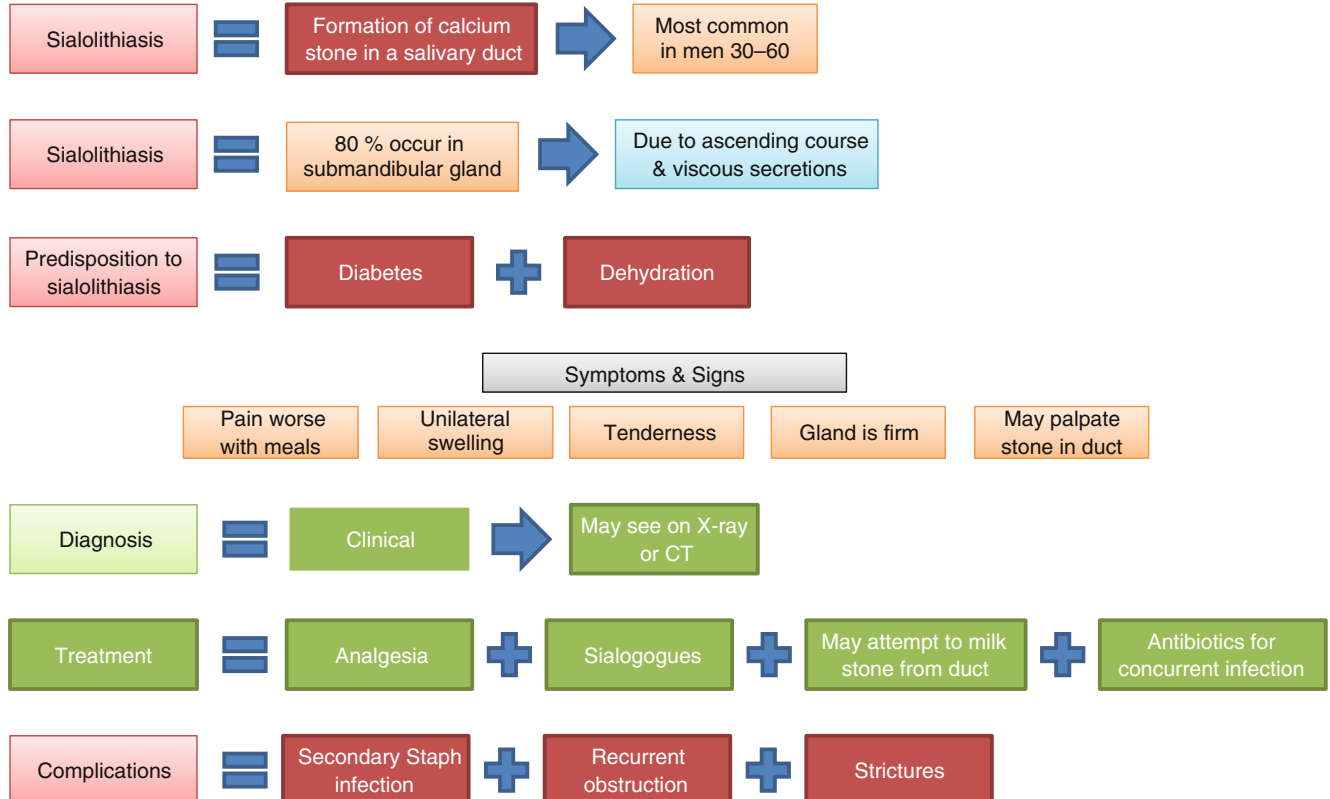
Viral Parotitis (Mumps)



Suppurative Parotitis

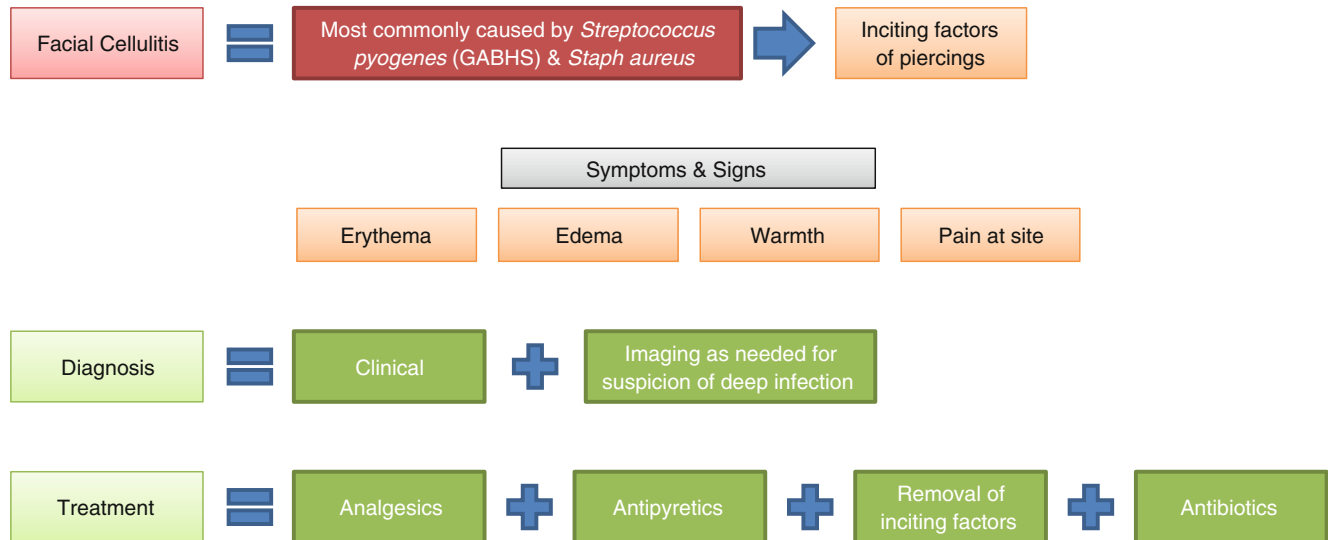


Sialolithiasis

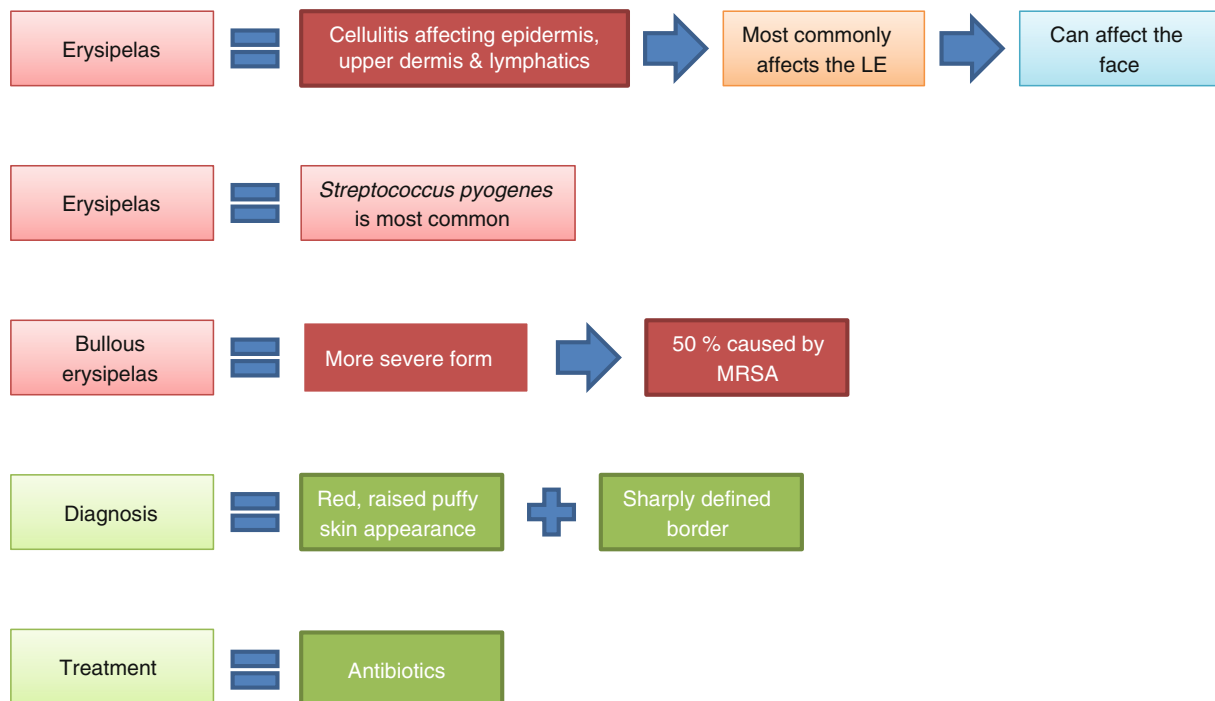


Facial Infections

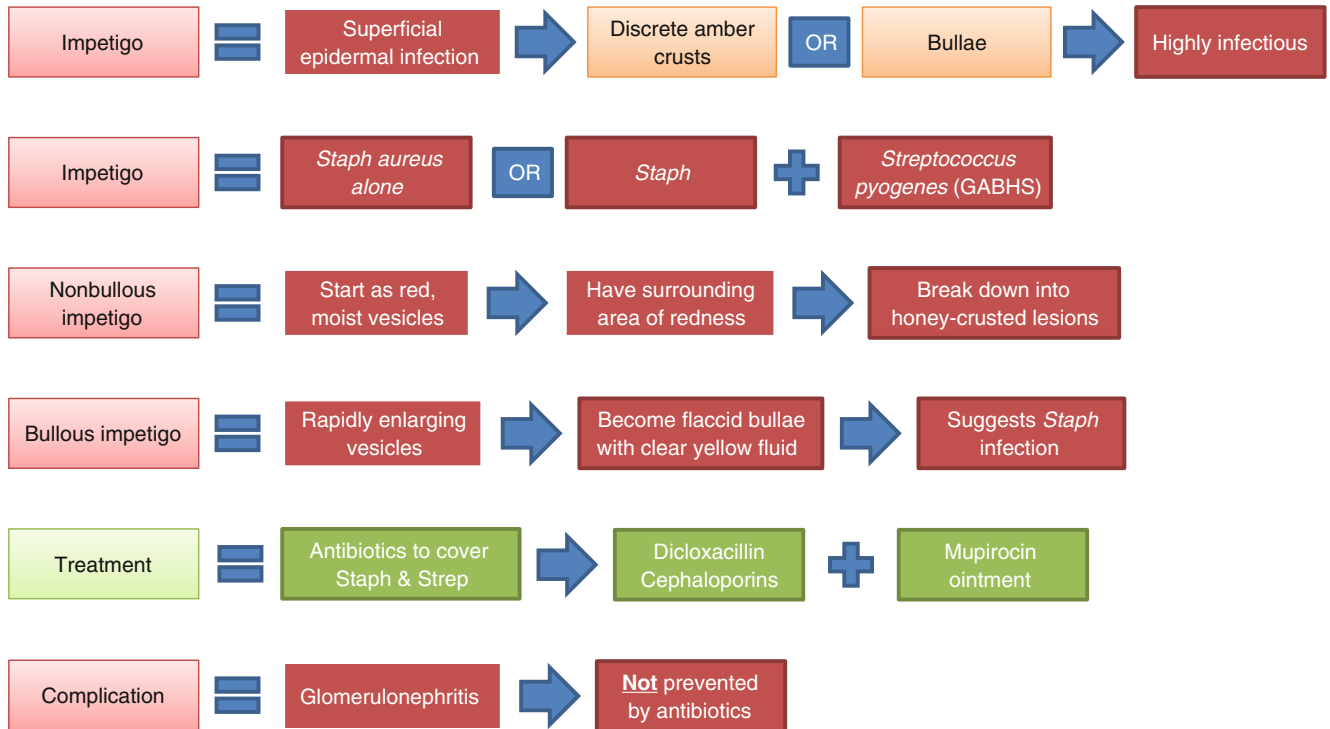
Facial Cellulitis



Erysipelas

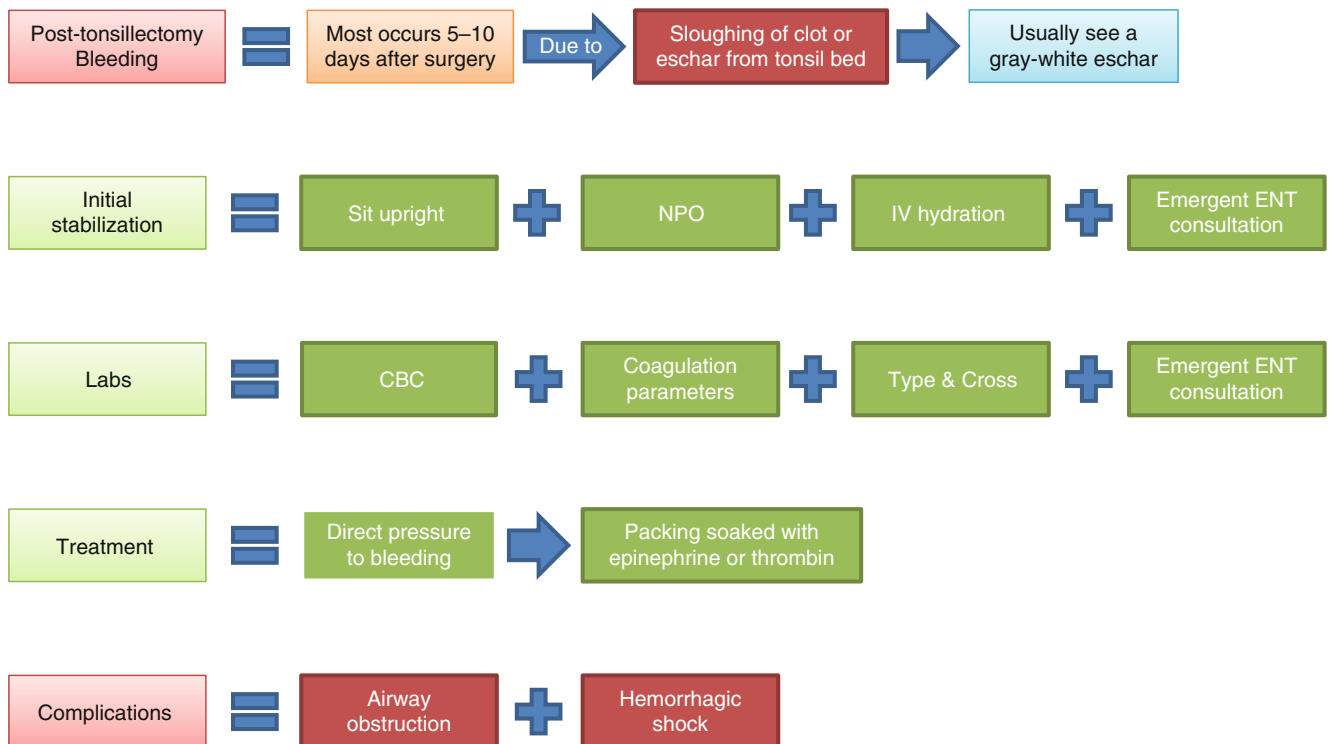


Impetigo

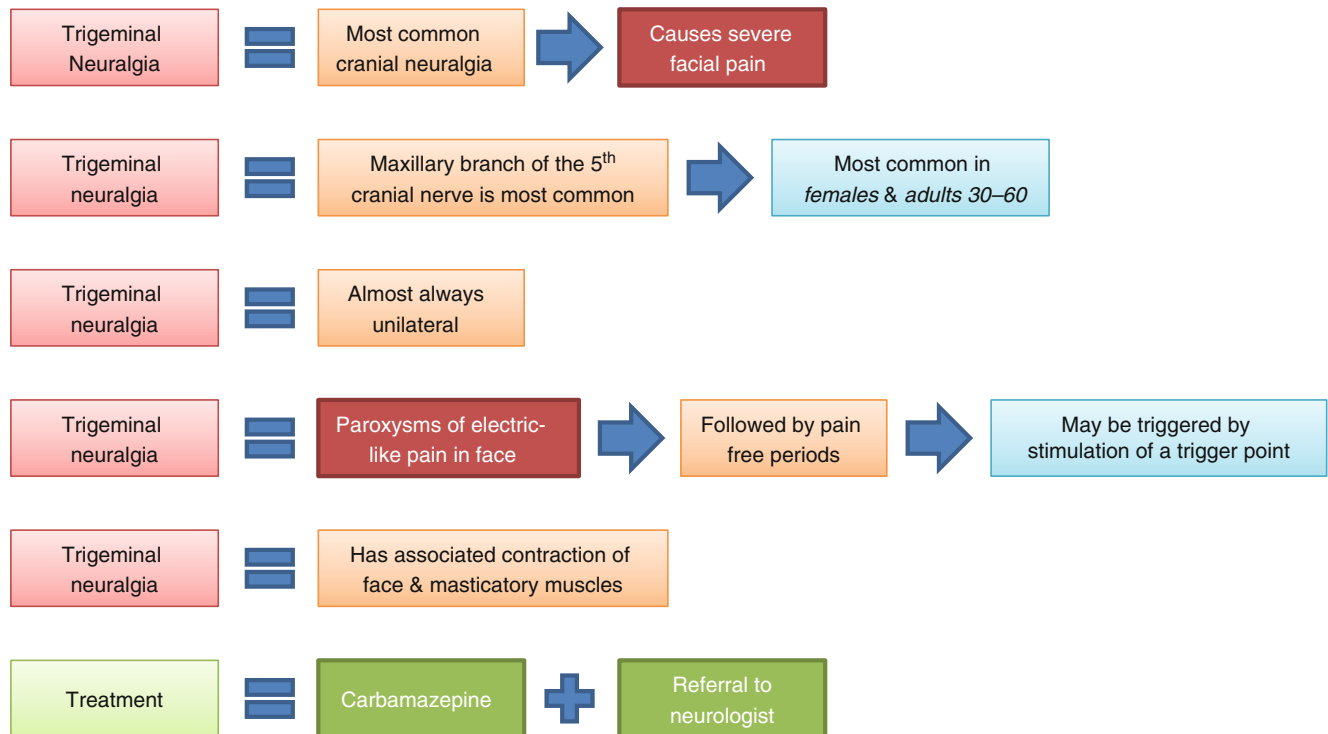


Other ENT Emergencies

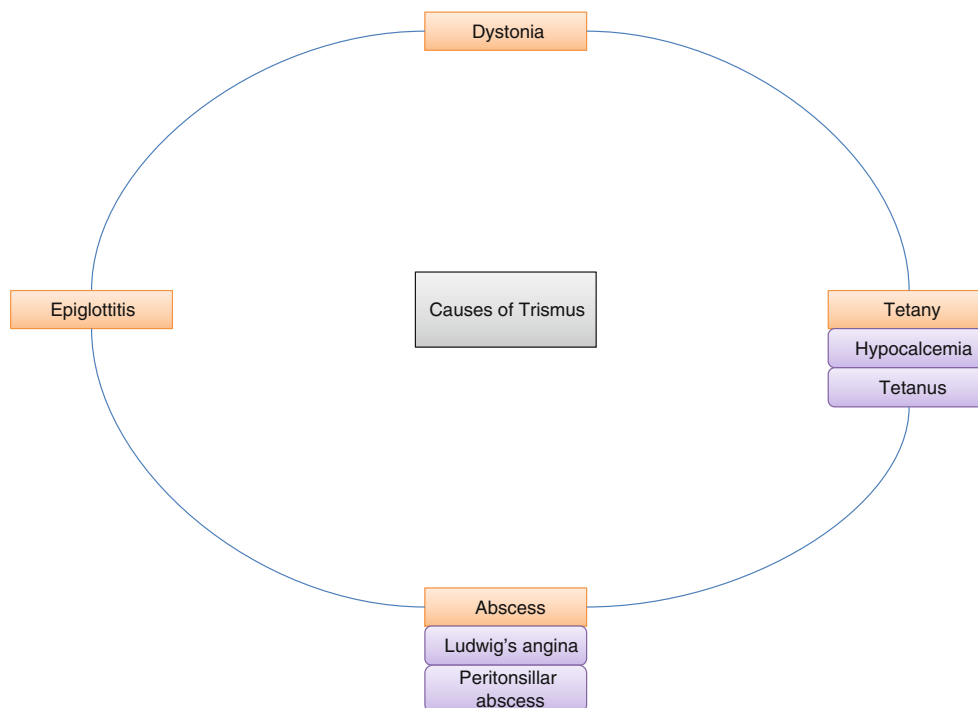
Post-tonsillectomy Bleeding



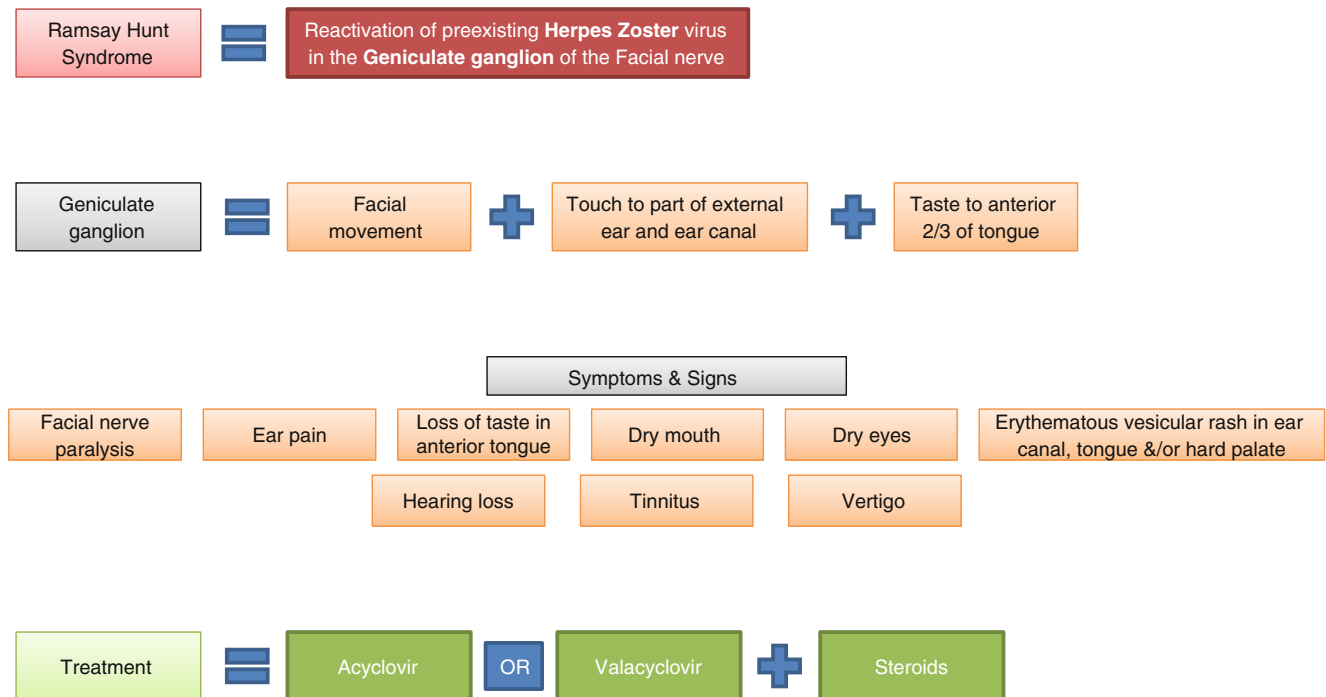
Trigeminal Neuralgia



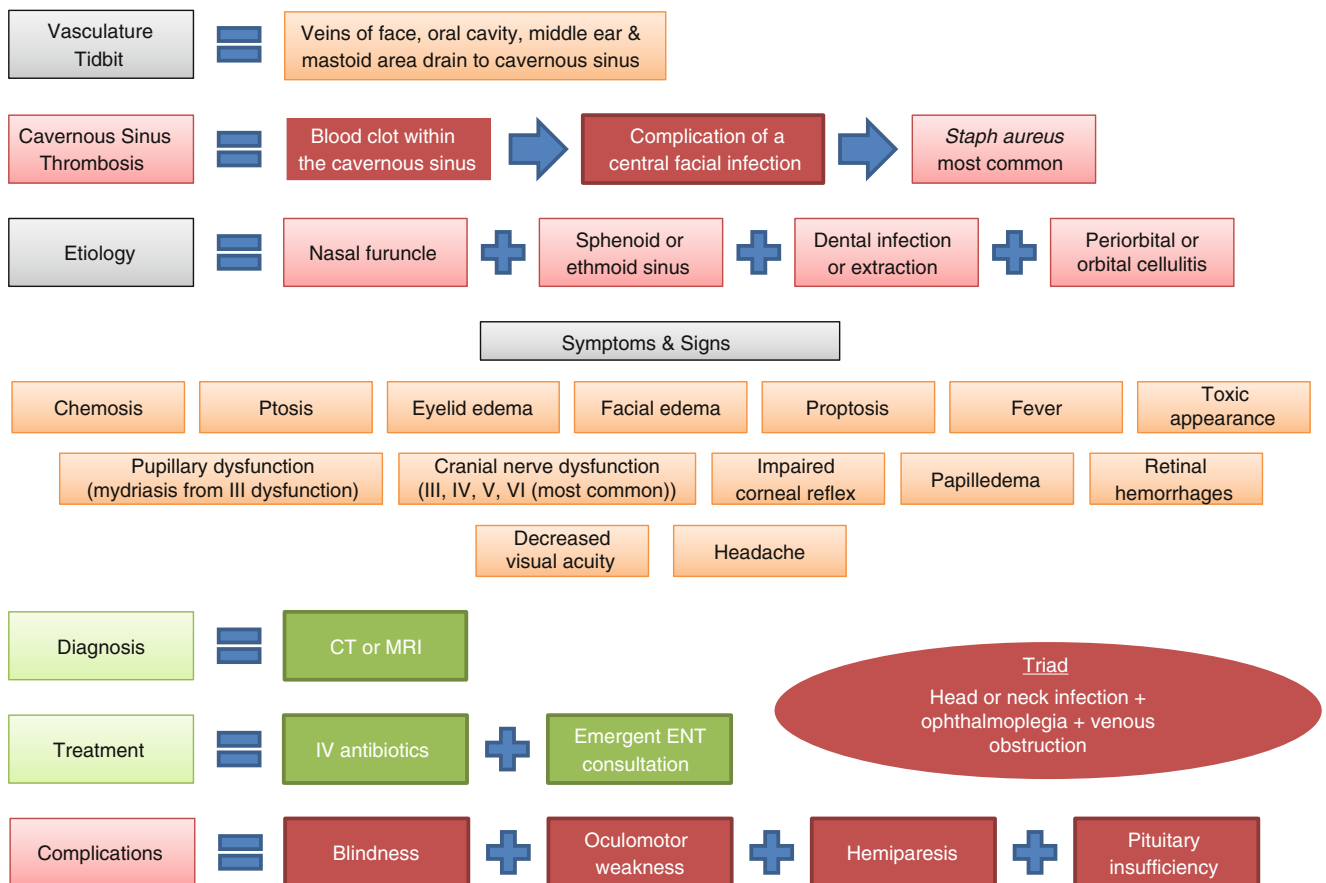
Causes of Trismus

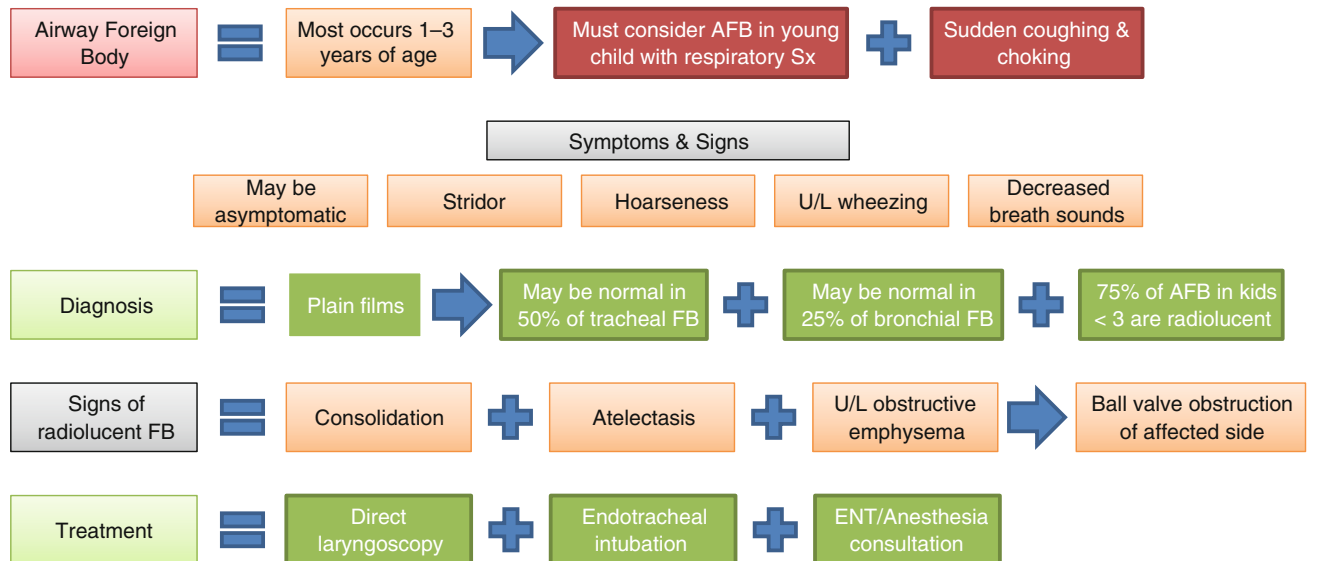


Ramsay Hunt Syndrome



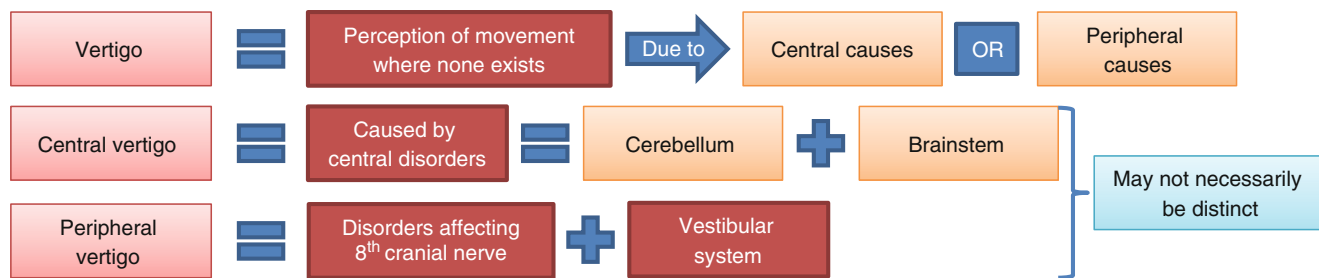
Cavernous Sinus Thrombosis



Airway Foreign Body (AFB)**PEDIATRICS**

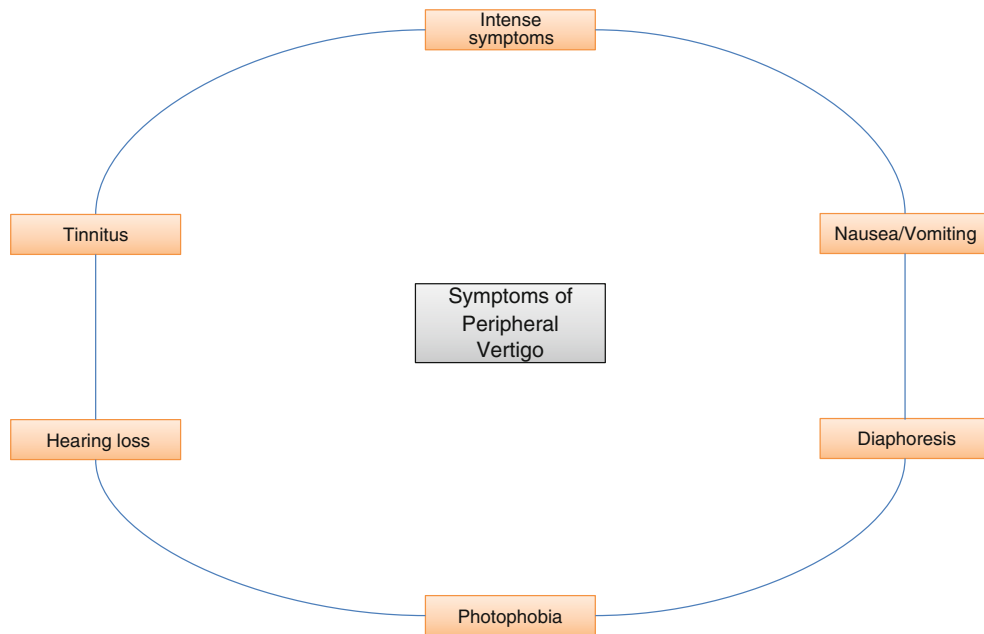
Vertigo

Introduction

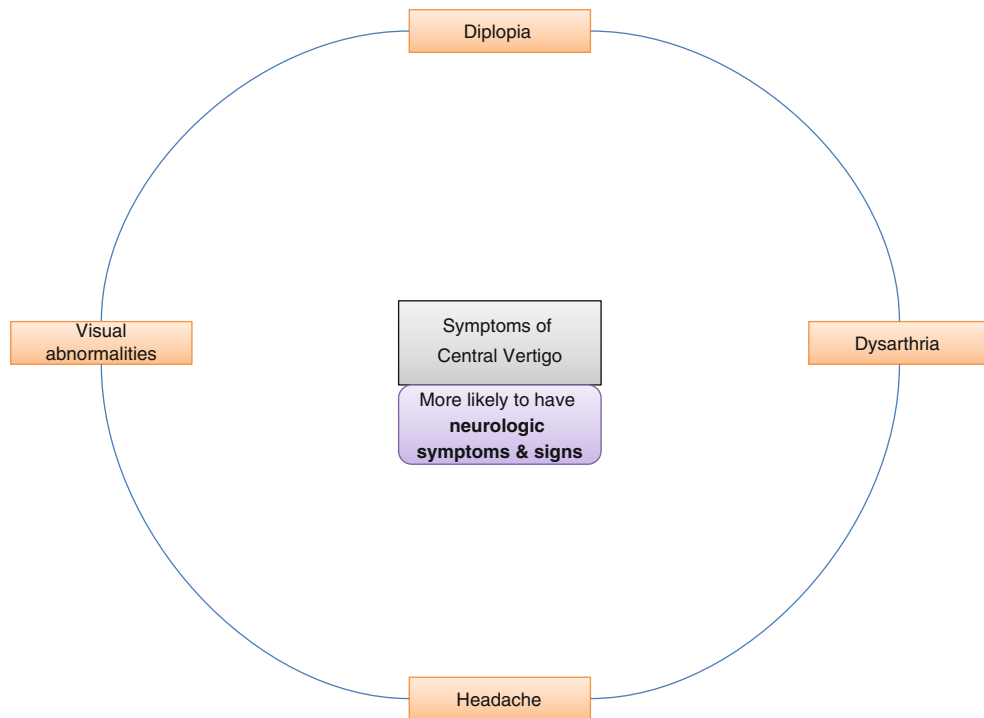


	Central	Peripheral
Onset	Slow	Sudden
Severity	Less intense	Severe spinning
Instances	Constant	Paroxysmal
Movement aggravated	No	Yes
Nausea	Infrequent	Frequent
Nystagmus	Vertical	Horizontal, rotatory-vertical
Fatiguability	No	Yes
Hearing loss	No	Possible
Tinnitus	No	Possible
TM	No	Possible
CNS Symptoms	Yes	No

Symptoms of Peripheral Vertigo

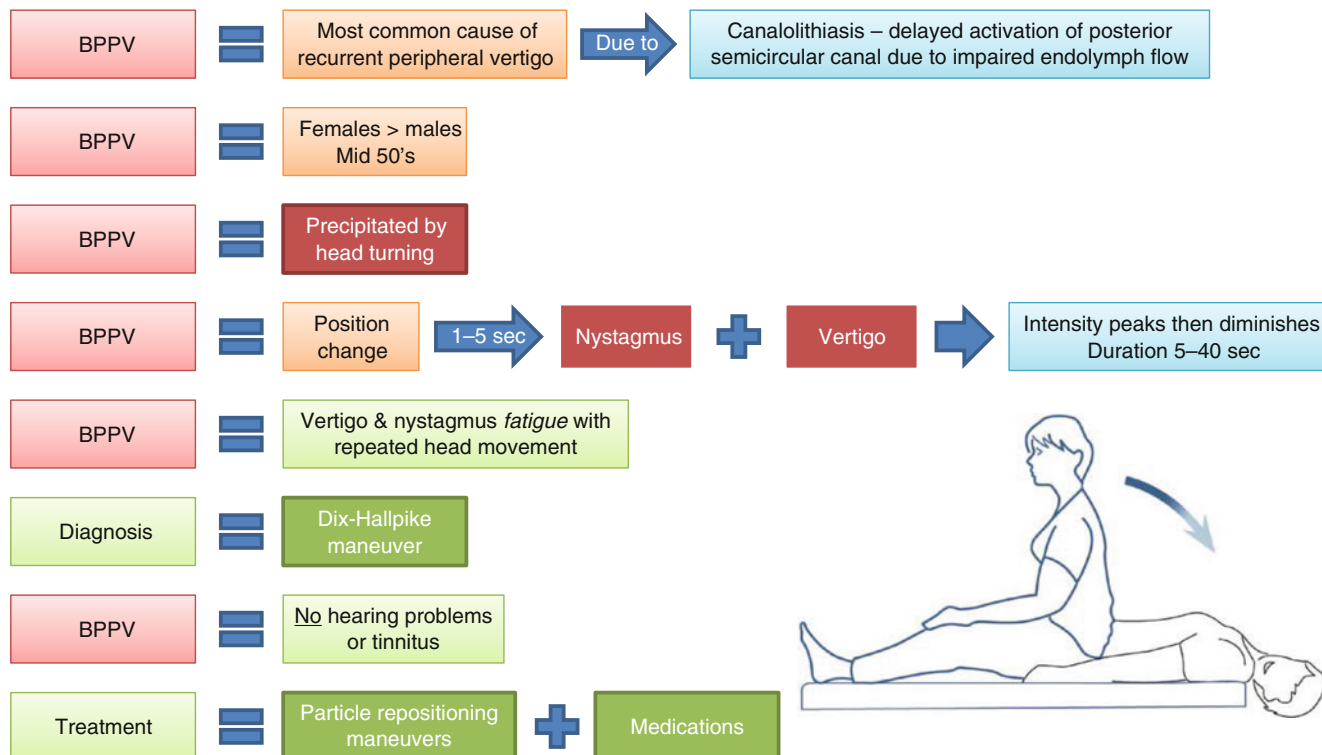


Symptoms of Central Vertigo



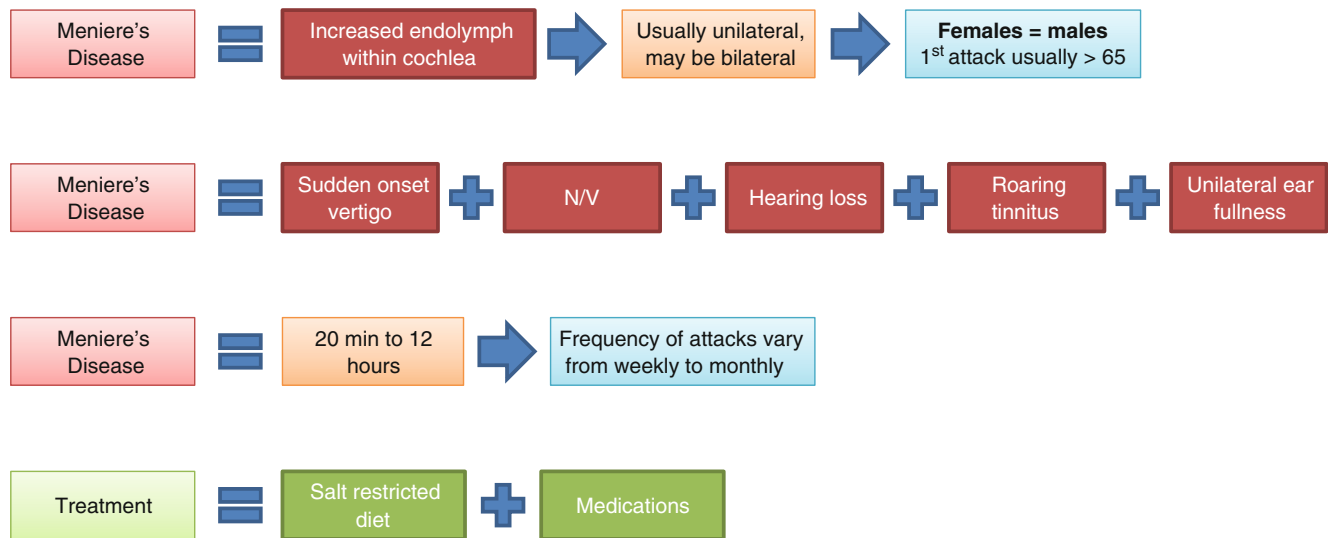
Peripheral Vertigo

Benign Paroxysmal Positional Vertigo (BPPV)

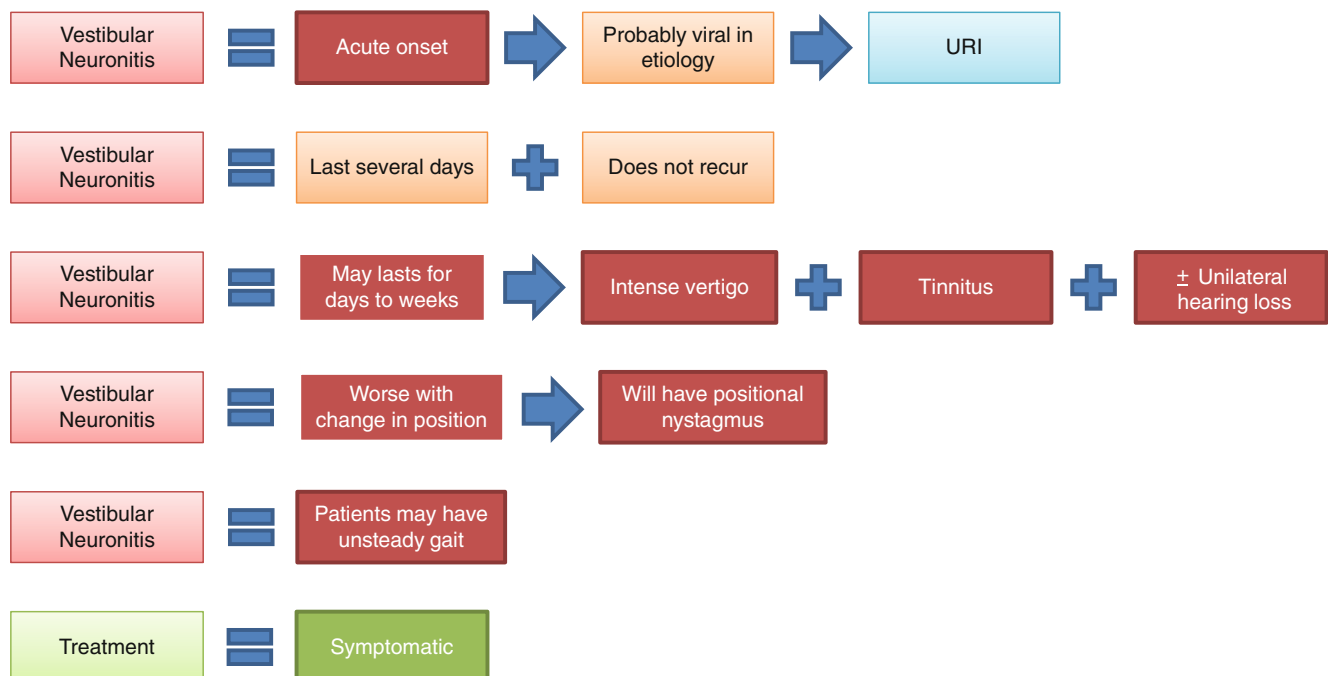


Bottom right image (Reprinted from Önerci TM. Vertigo. In: Önerci TM, editors. Diagnosis in otorhinolaryngology: an illustrated guide. Heidelberg: Springer Verlag; 2010. p. 54–6. With permission from Springer Verlag)

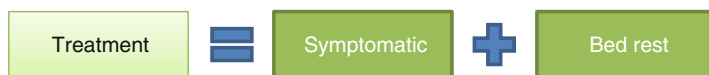
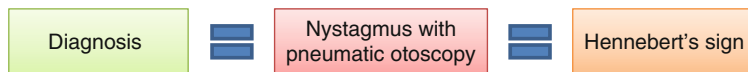
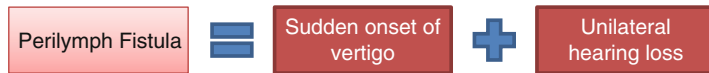
Meniere's Disease



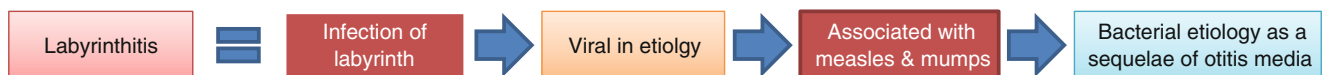
Vestibular Neuronitis



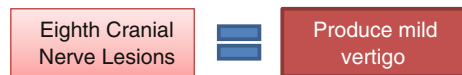
Perilymph Fistula



Labyrinthitis



Eighth Cranial Nerve Lesions



Cerebellopontine Angle Tumors

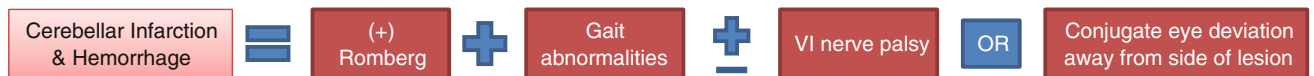


Posttraumatic Vertigo and Post-concussive Syndrome

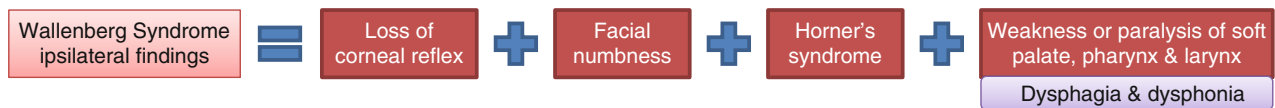
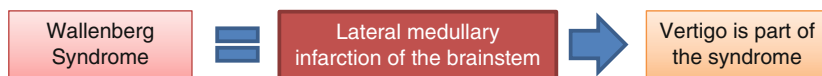


Central Vertigo

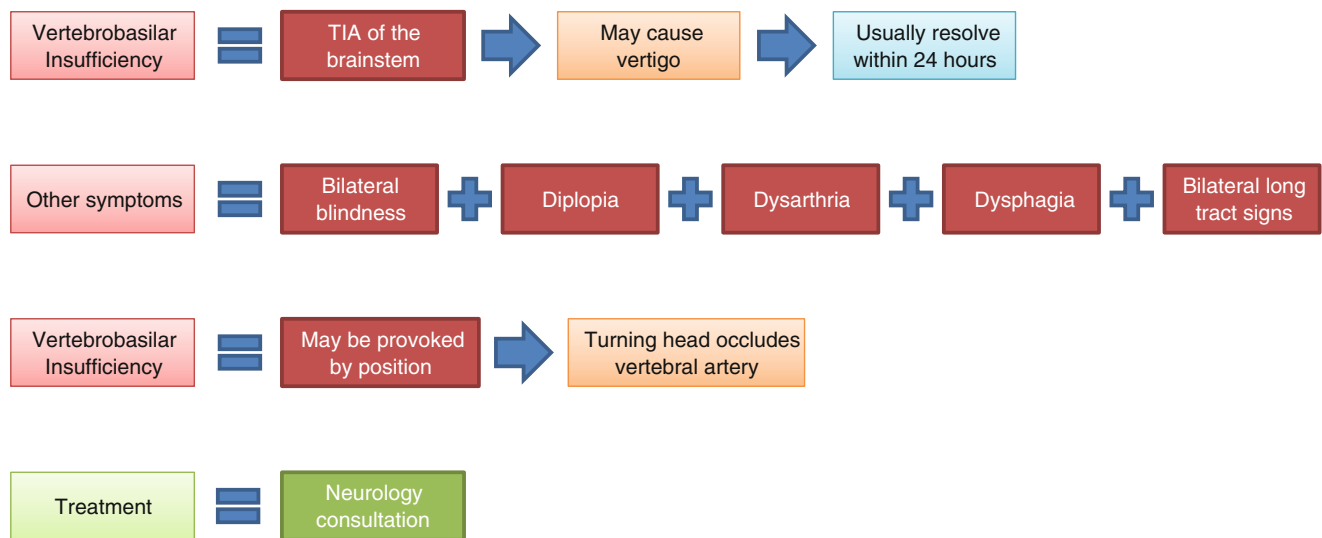
Cerebellar Infarction and Hemorrhage



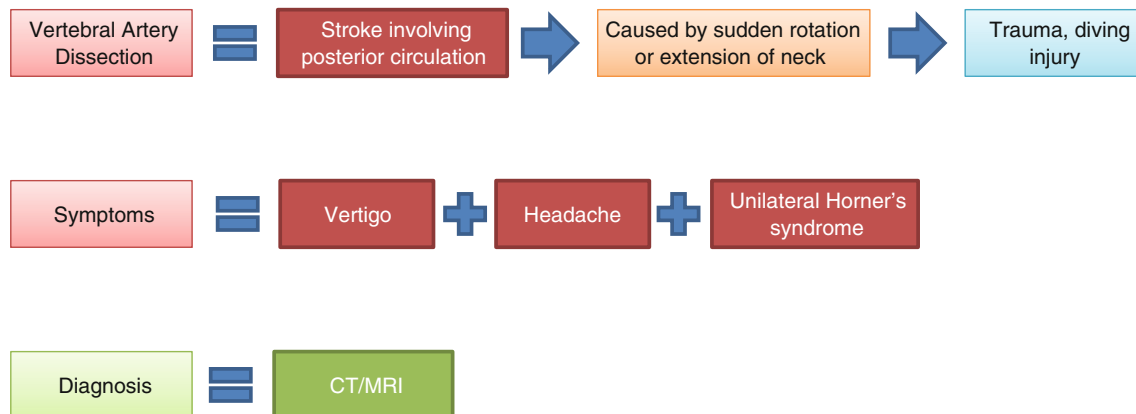
Wallenberg Syndrome



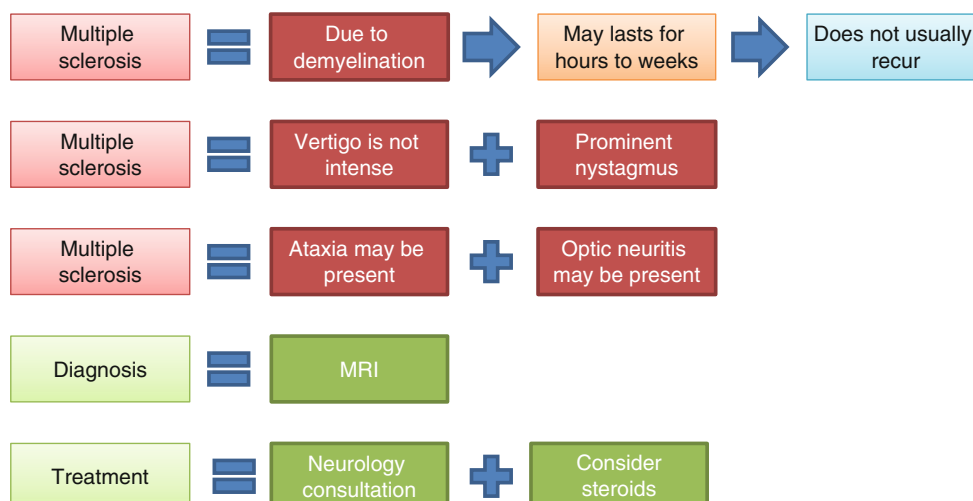
Vertebrobasilar Insufficiency

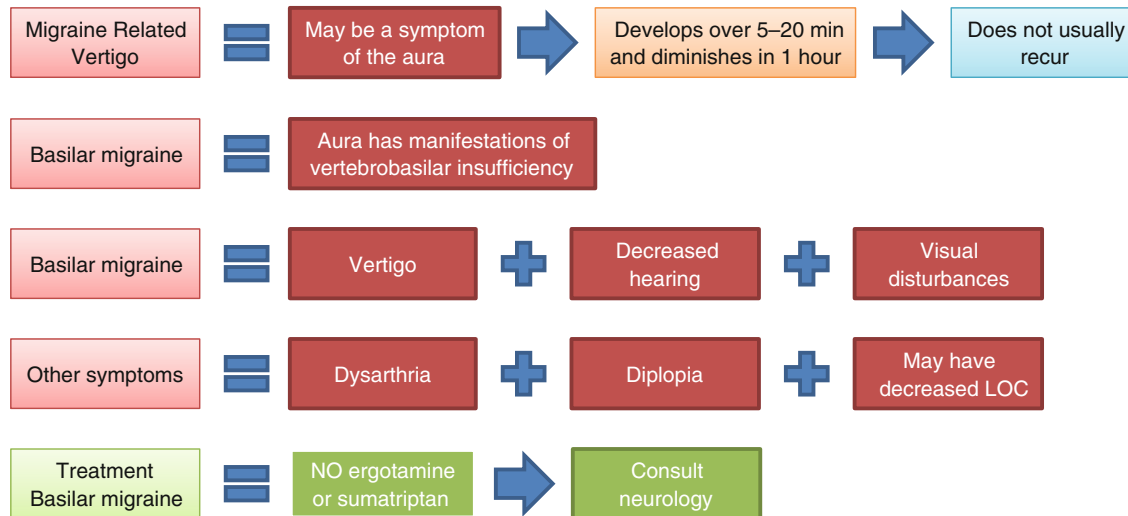


Vertebral Artery Dissection



Multiple Sclerosis



Migraine-Related Vertigo

Environmental Emergencies

Michael R. Marchick and Bobby Desai

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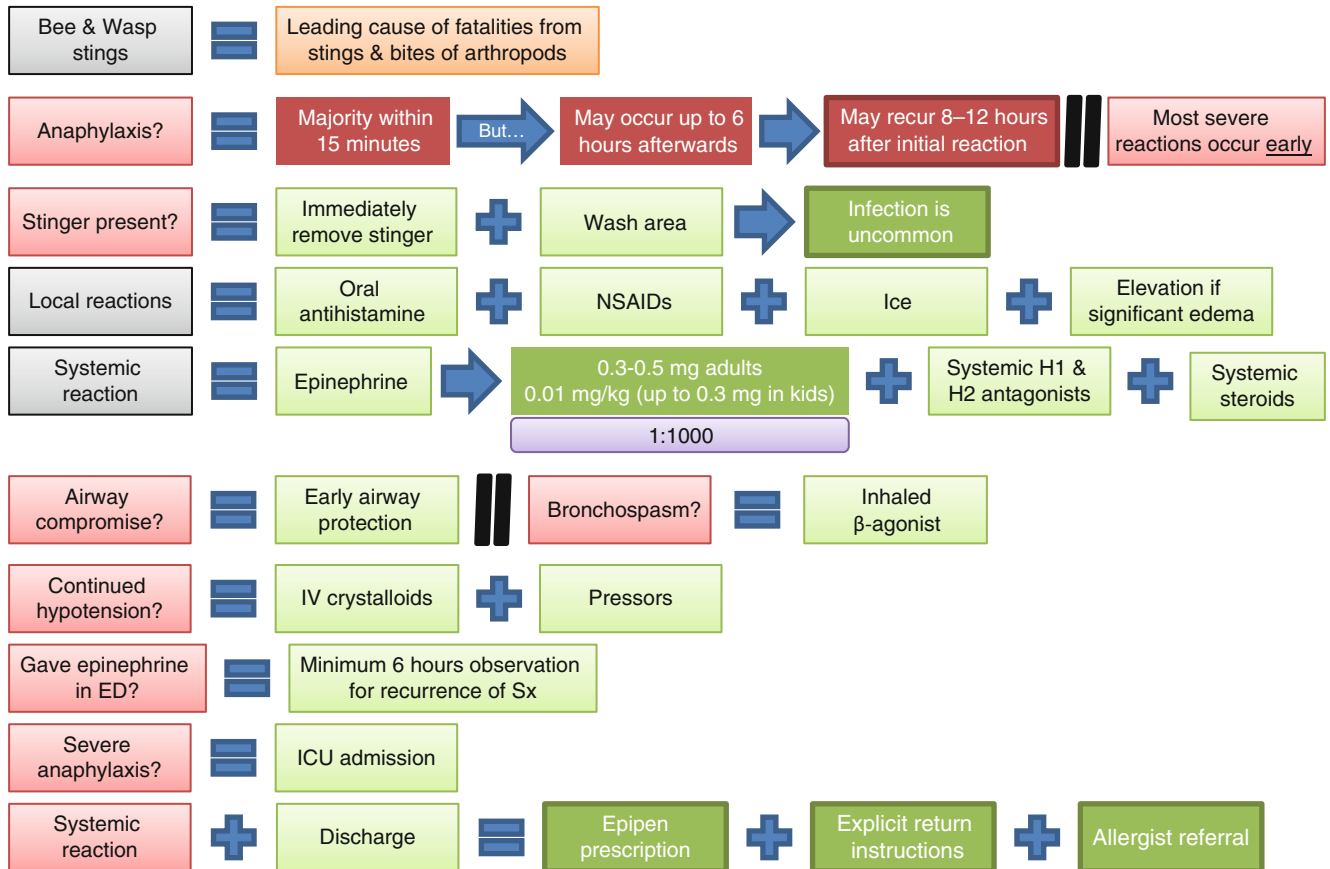
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M.R. Marchick, MD
Department of Emergency Medicine,
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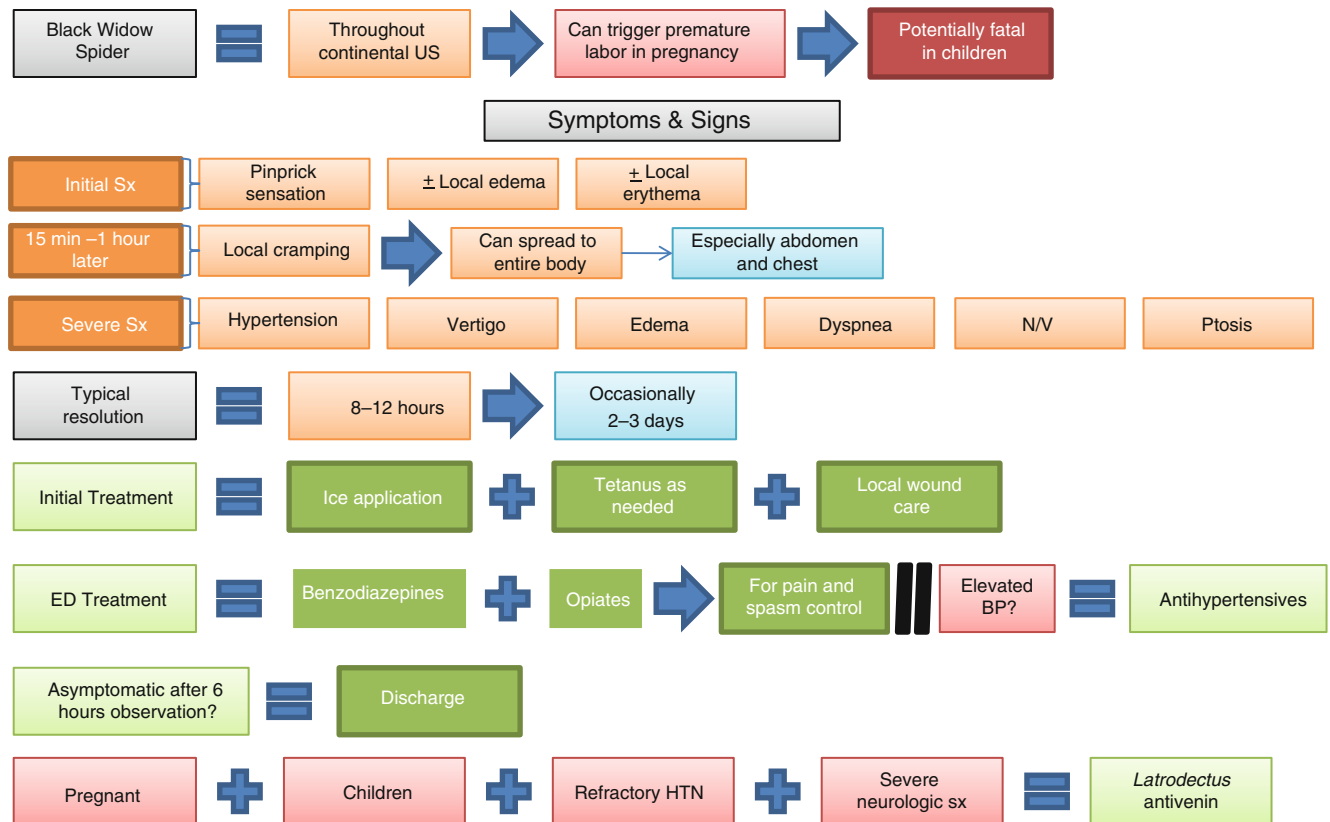
B. Desai, MD, MEd (✉)
Department of Emergency Medicine, University of Florida,
Gainesville, FL, USA
e-mail: bdesai@ufl.edu

Bites and Envenomations

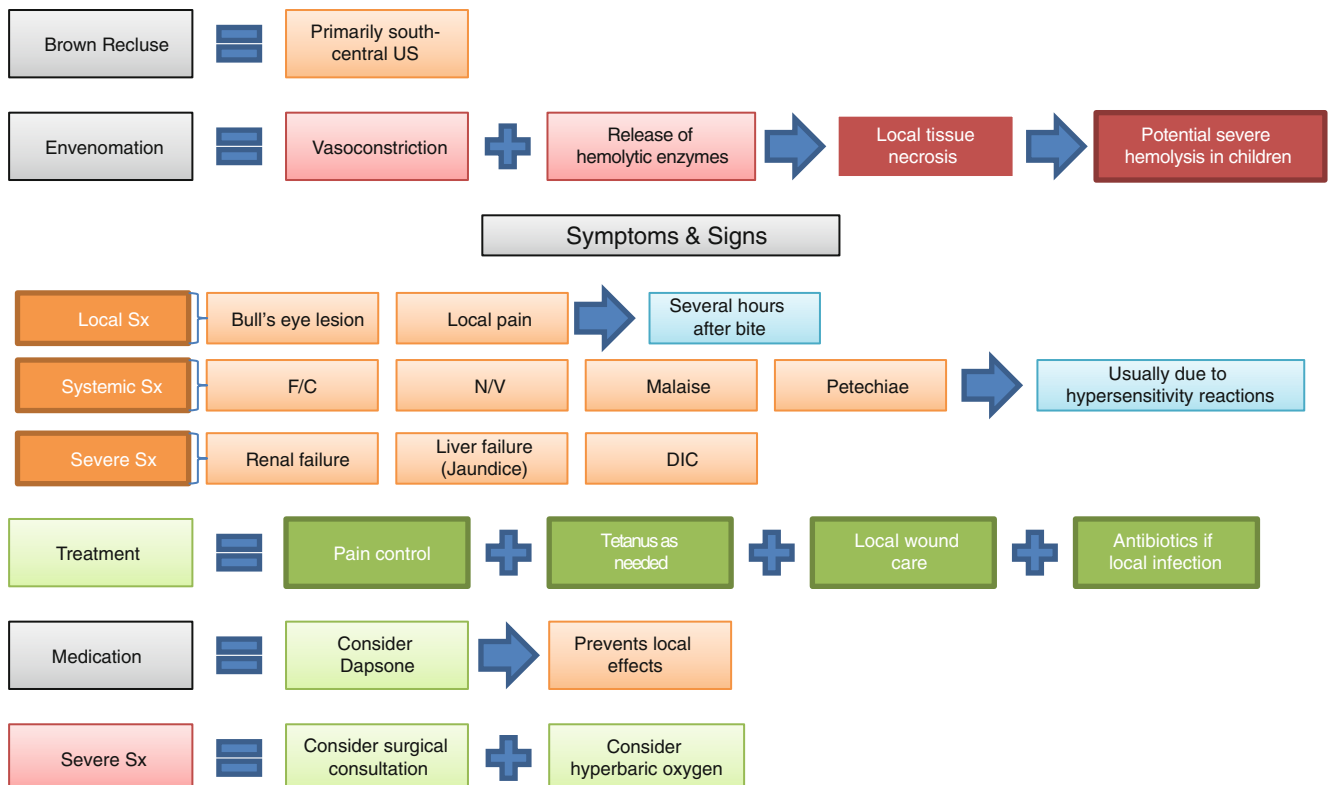
Bees/Wasps



Black Widow Envenomation

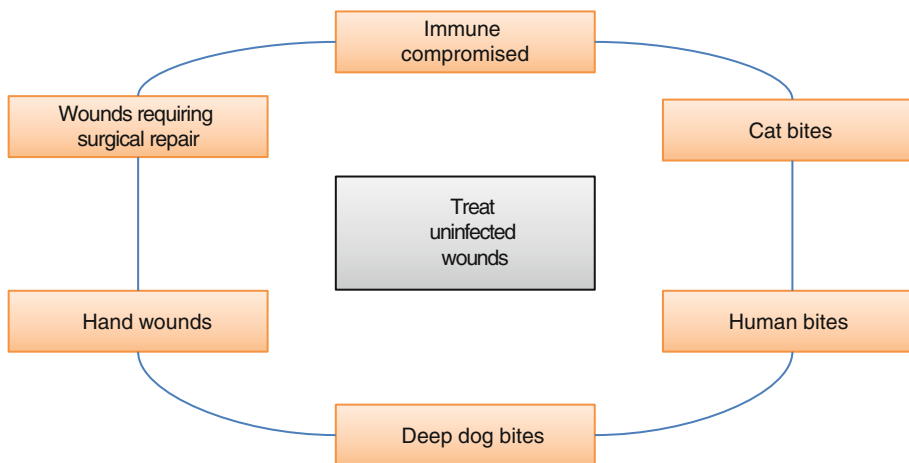
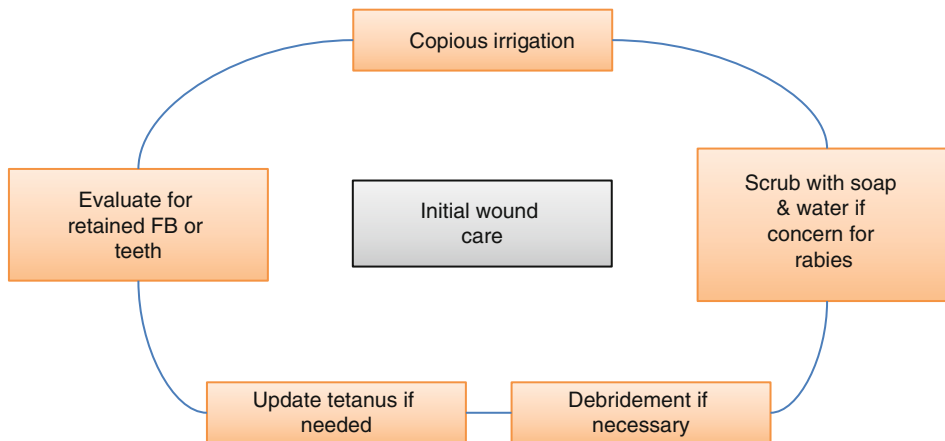


Brown Recluse Envenomation

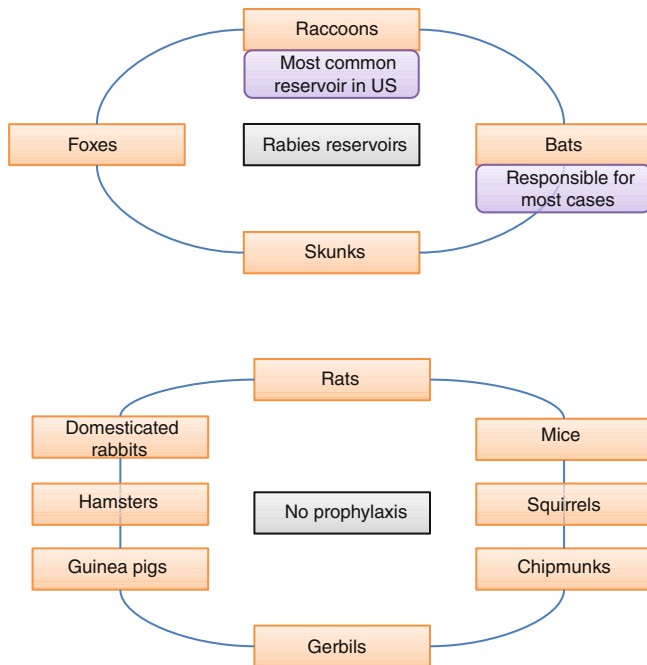


Mammalian Bites

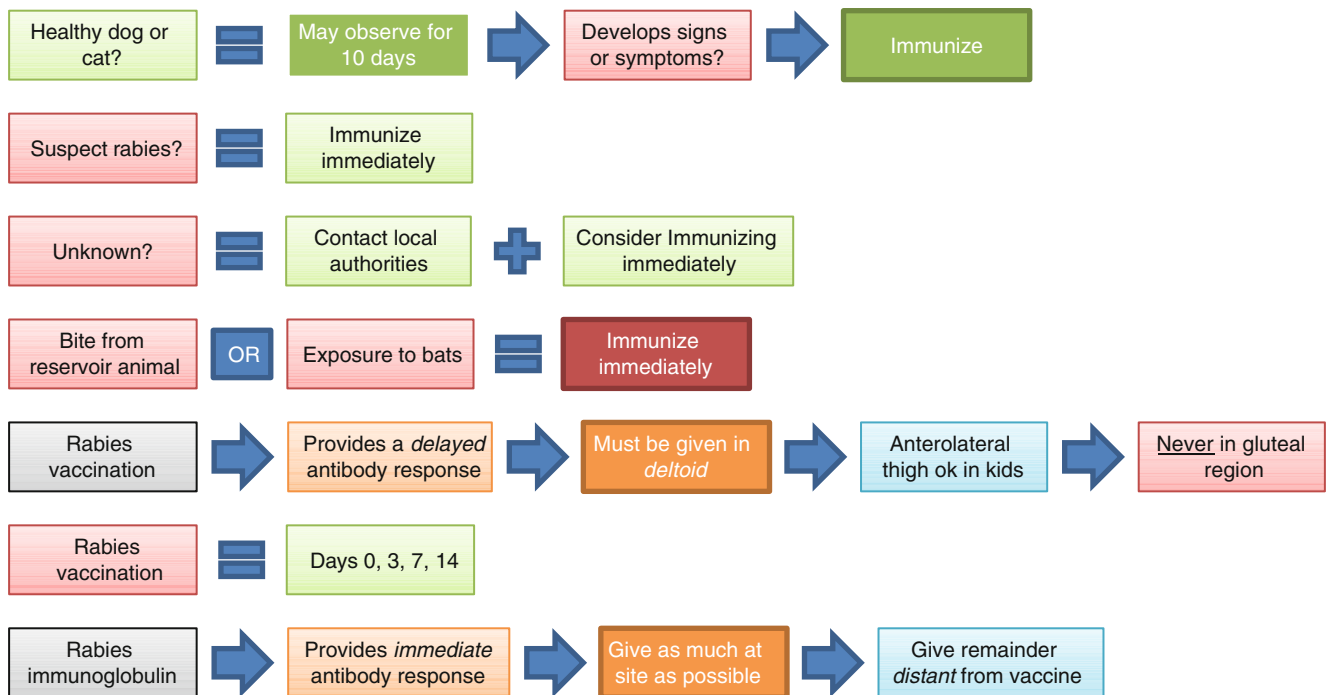
Bites: Introduction



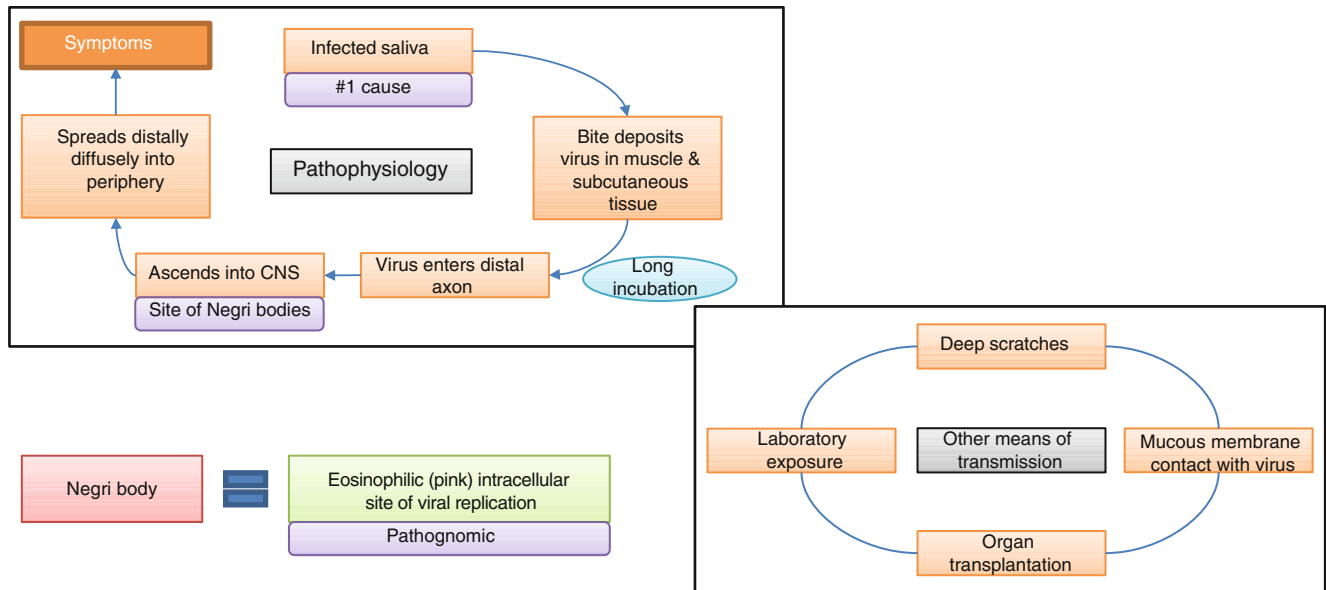
Rabies



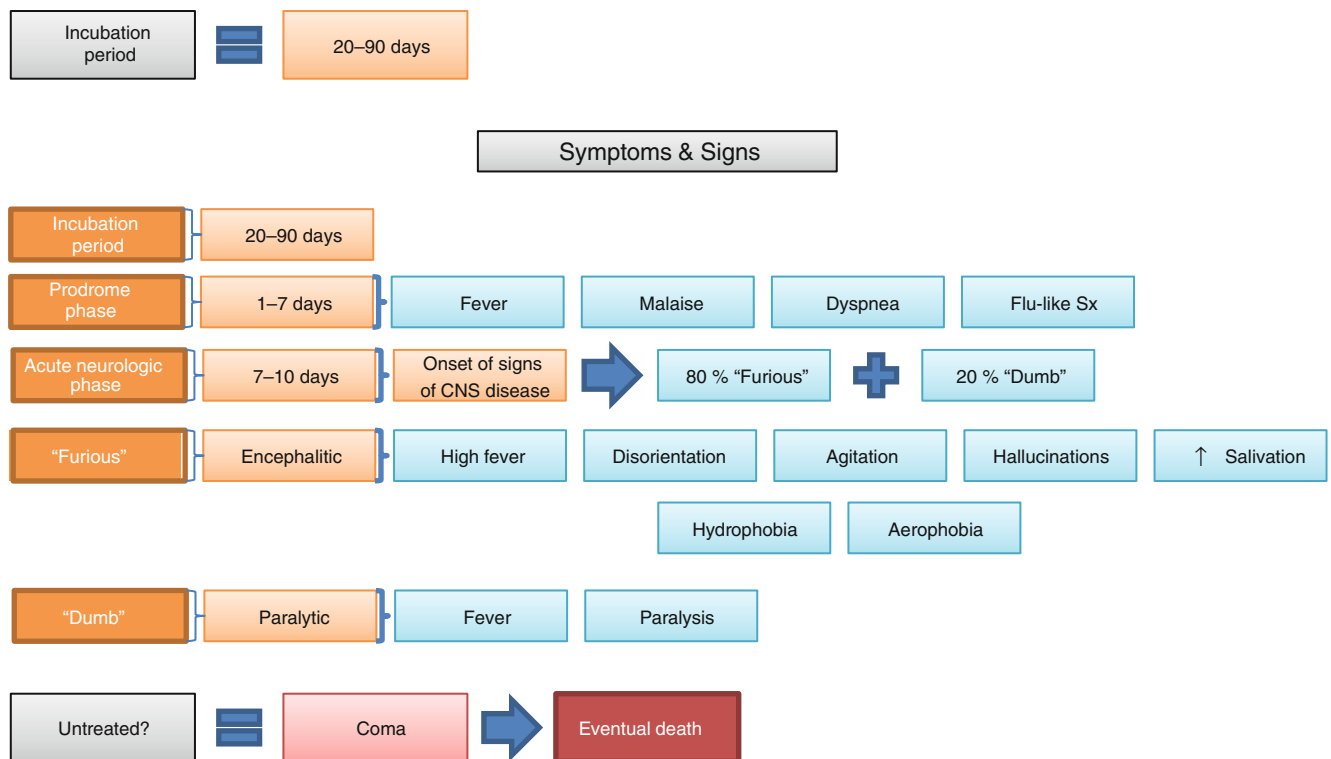
Rabies Vaccination



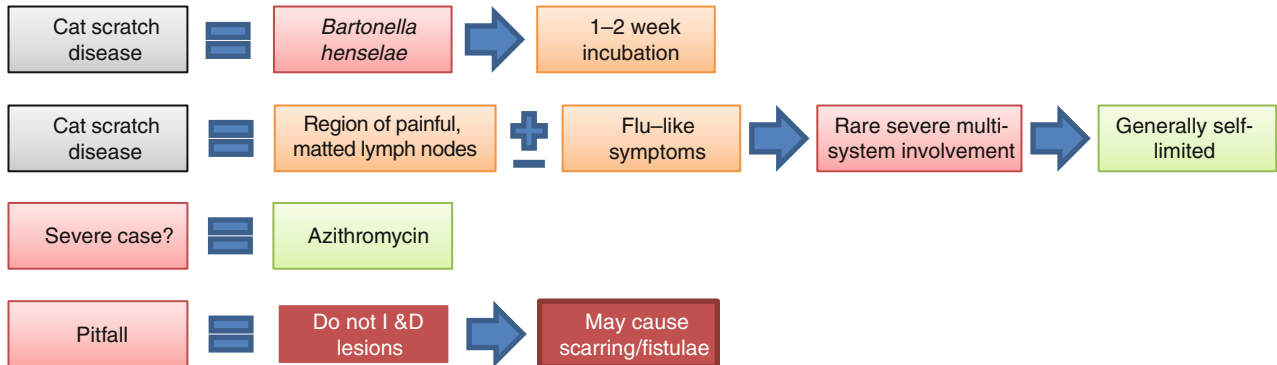
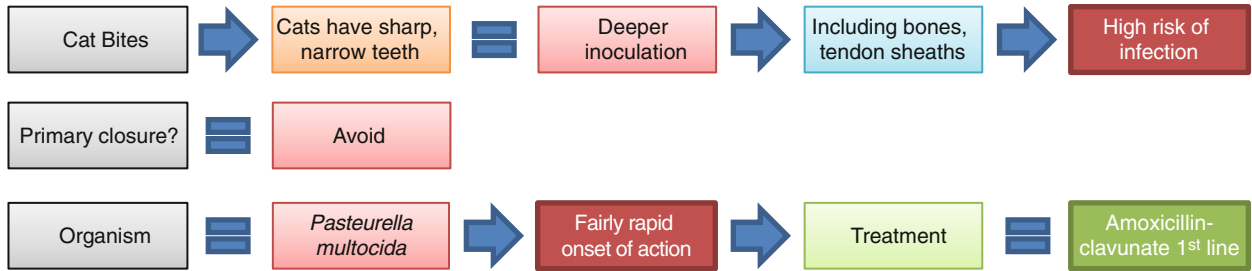
Rabies



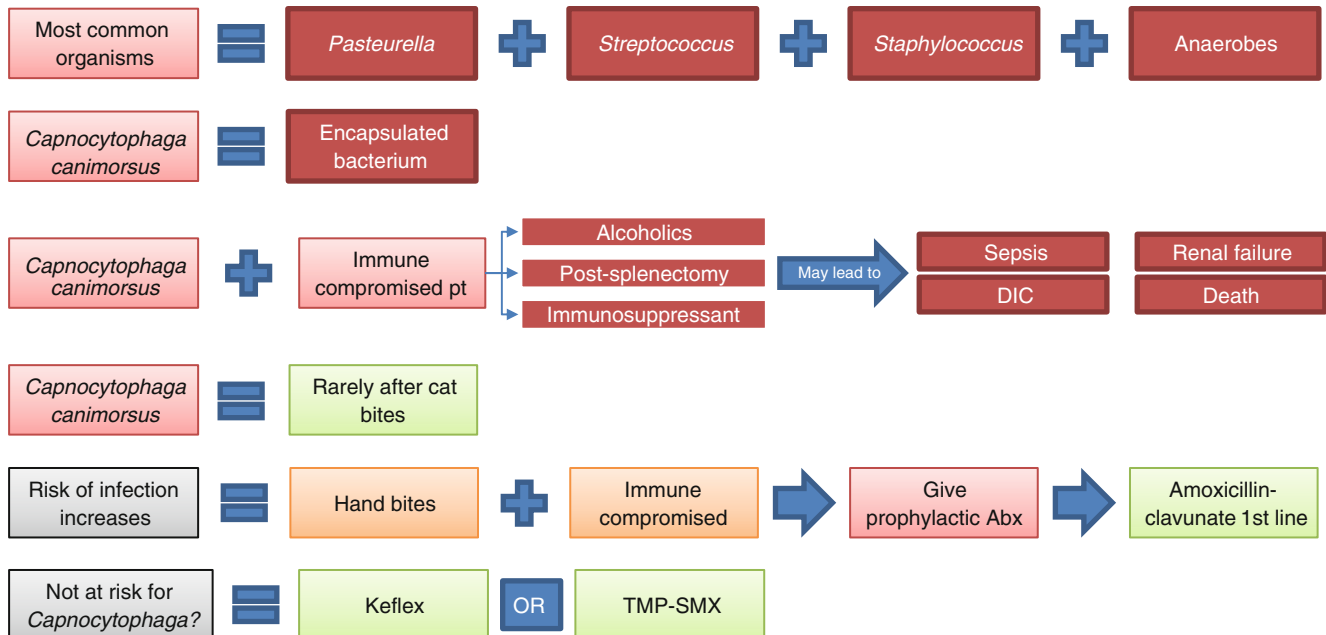
Rabies Symptoms and Signs



Cat Bites and Scratches

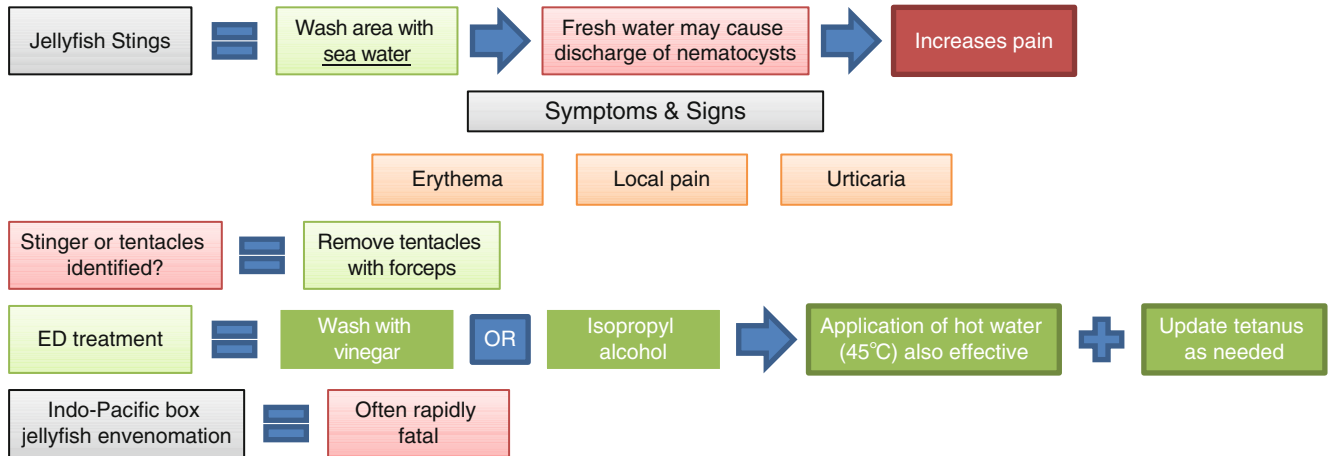


Dog Bites

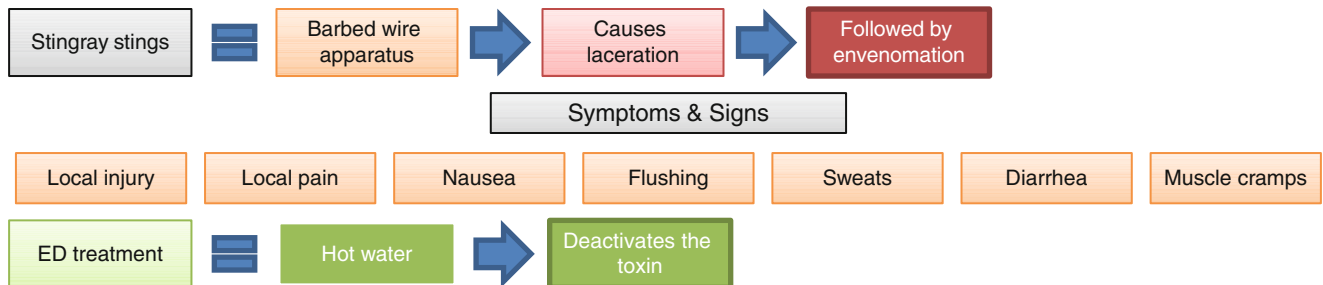


Marine Envenomation

Jellyfish Stings

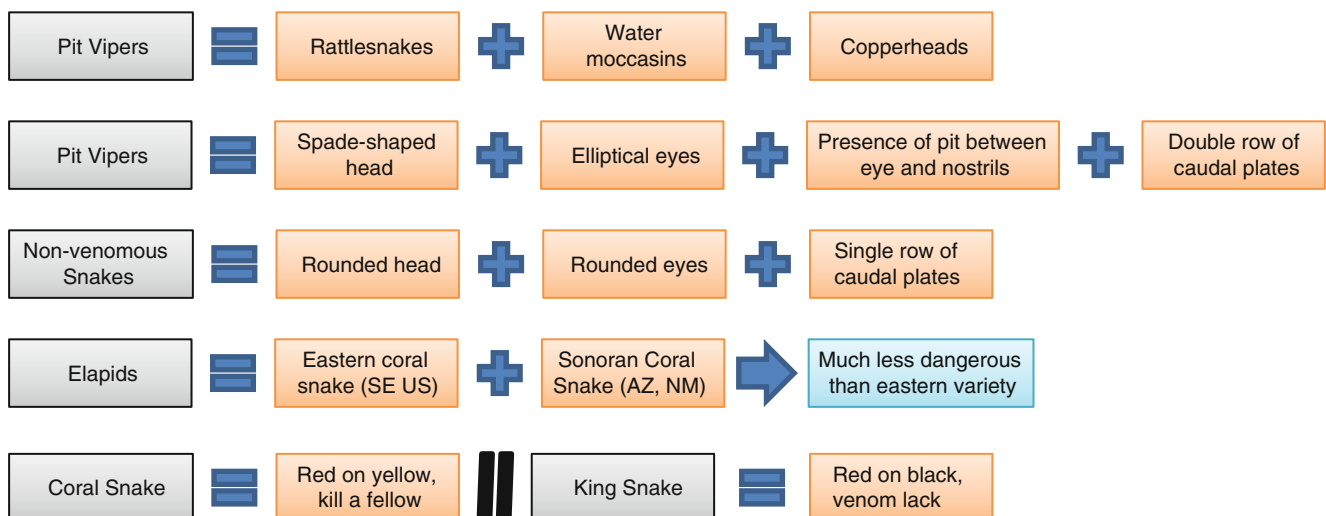


Stingray Stings

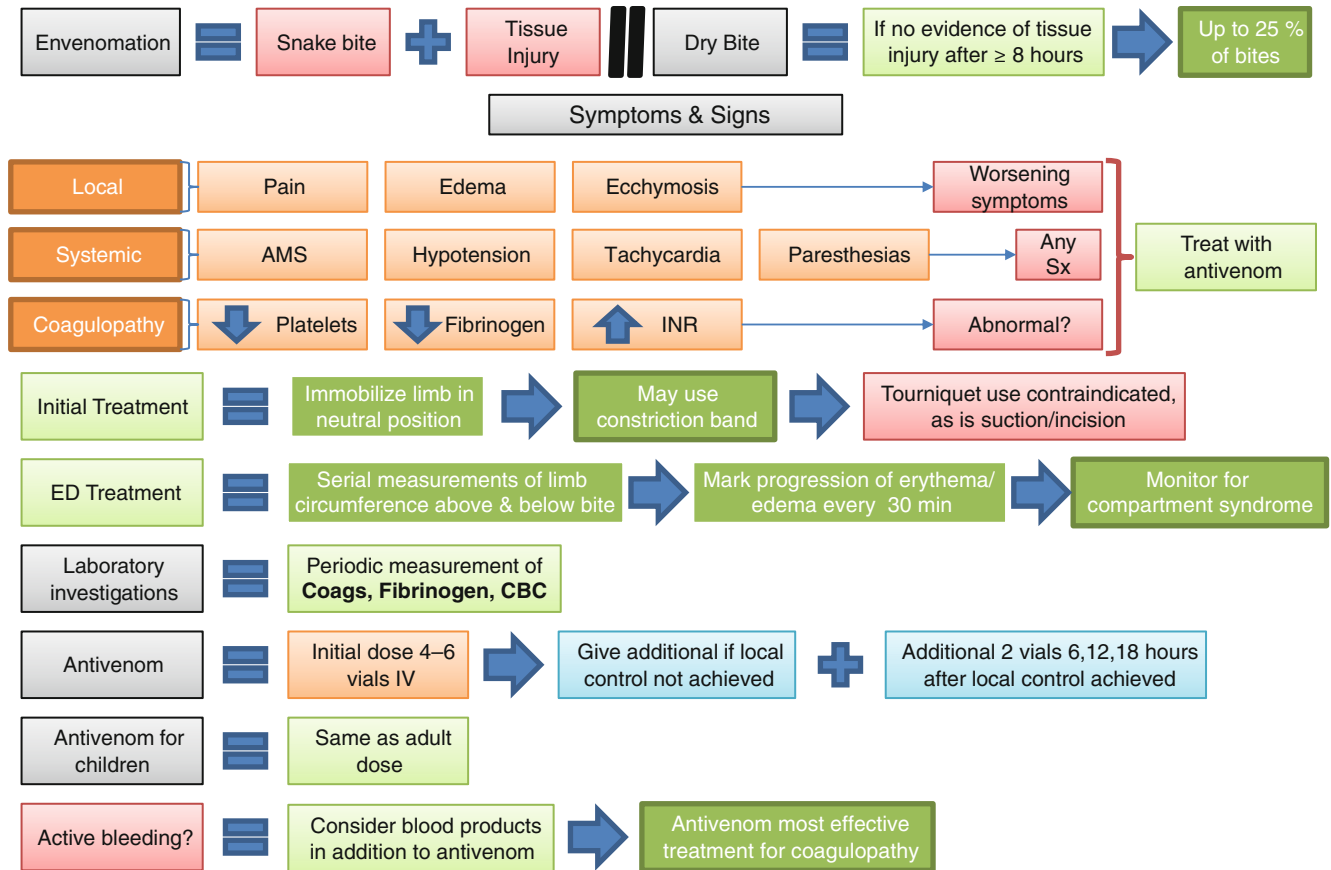


Snake Bites

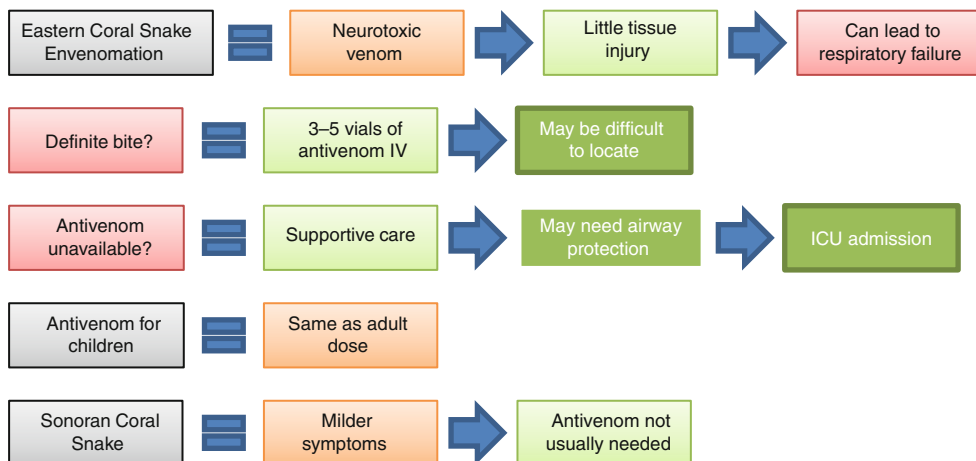
Snake Envenomation



Pit Viper Envenomation

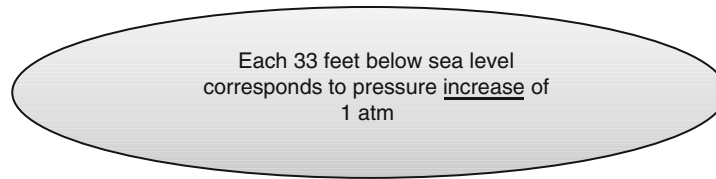


Eastern Coral Snake Envenomation

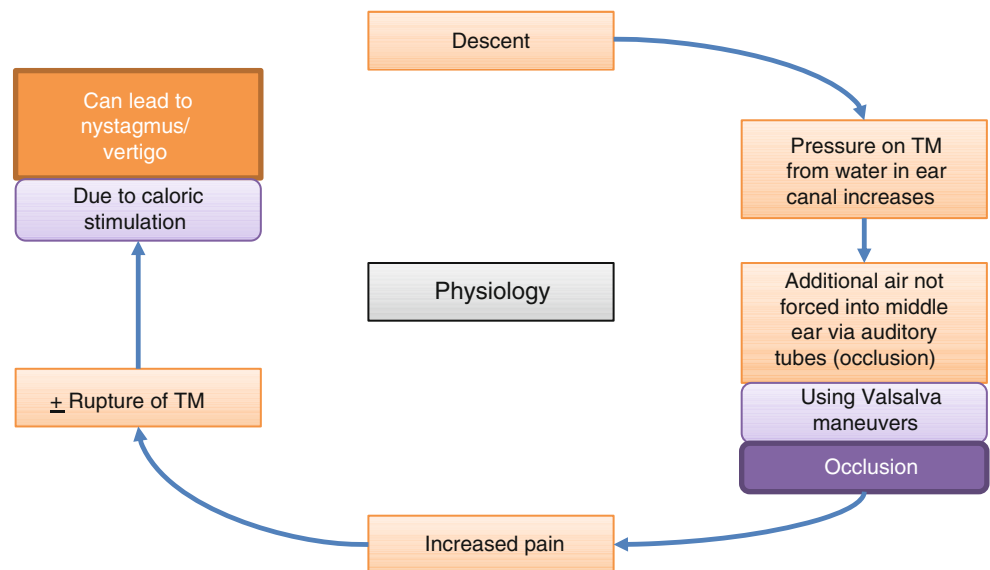
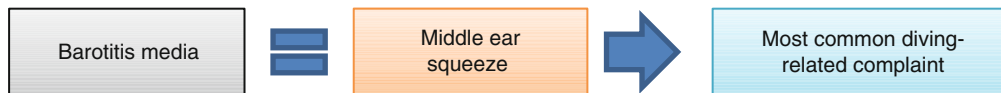


Dysbarism

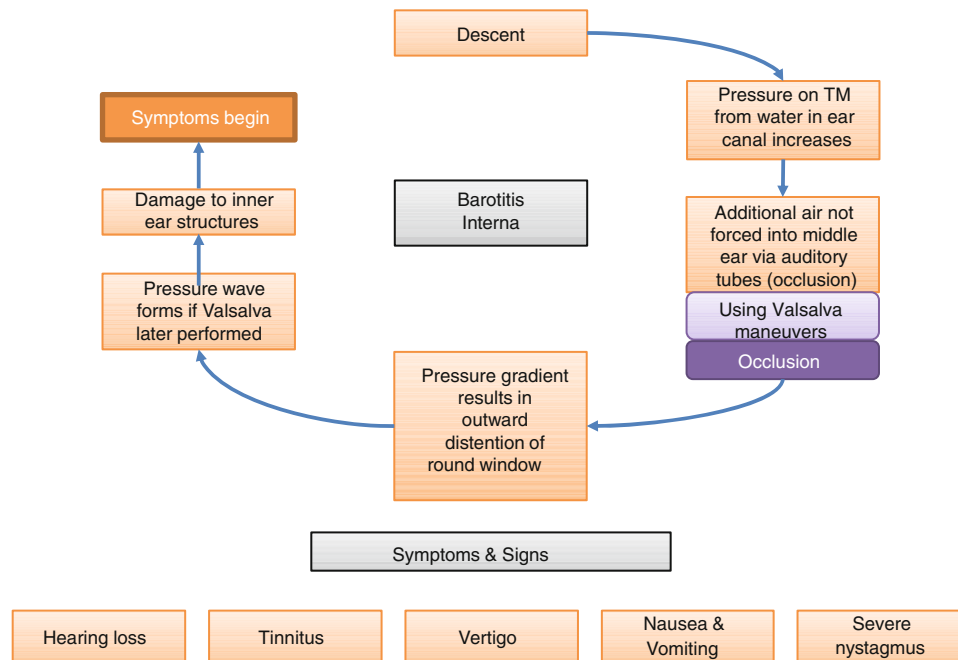
Introduction



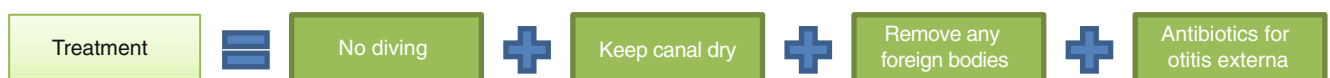
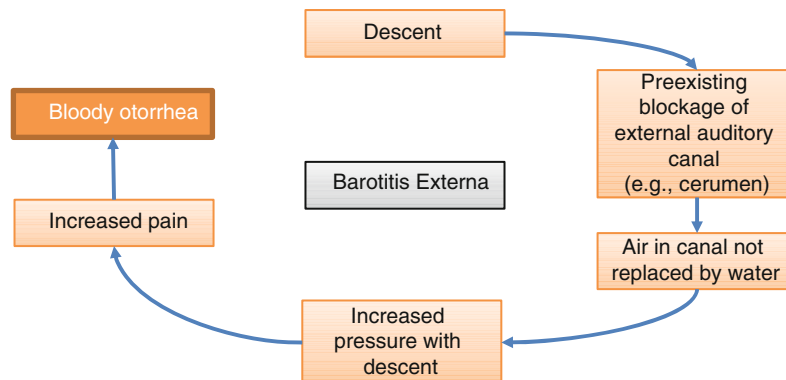
Barotrauma of Descent: Barotitis Media



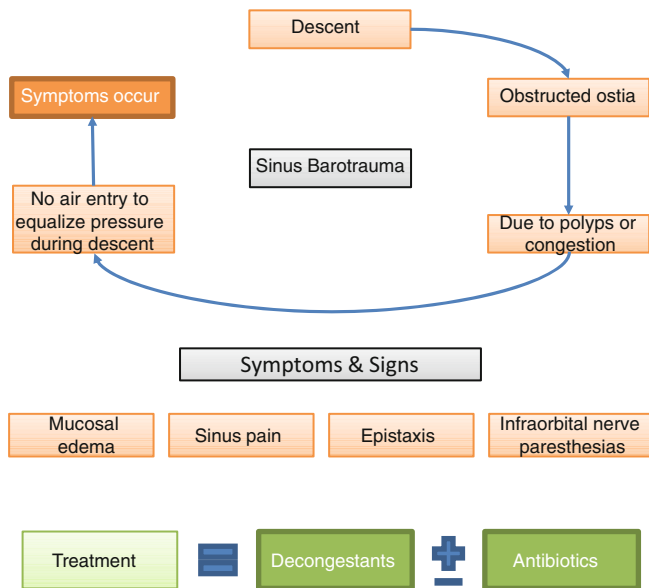
Barotrauma of Descent: Barotitis Interna



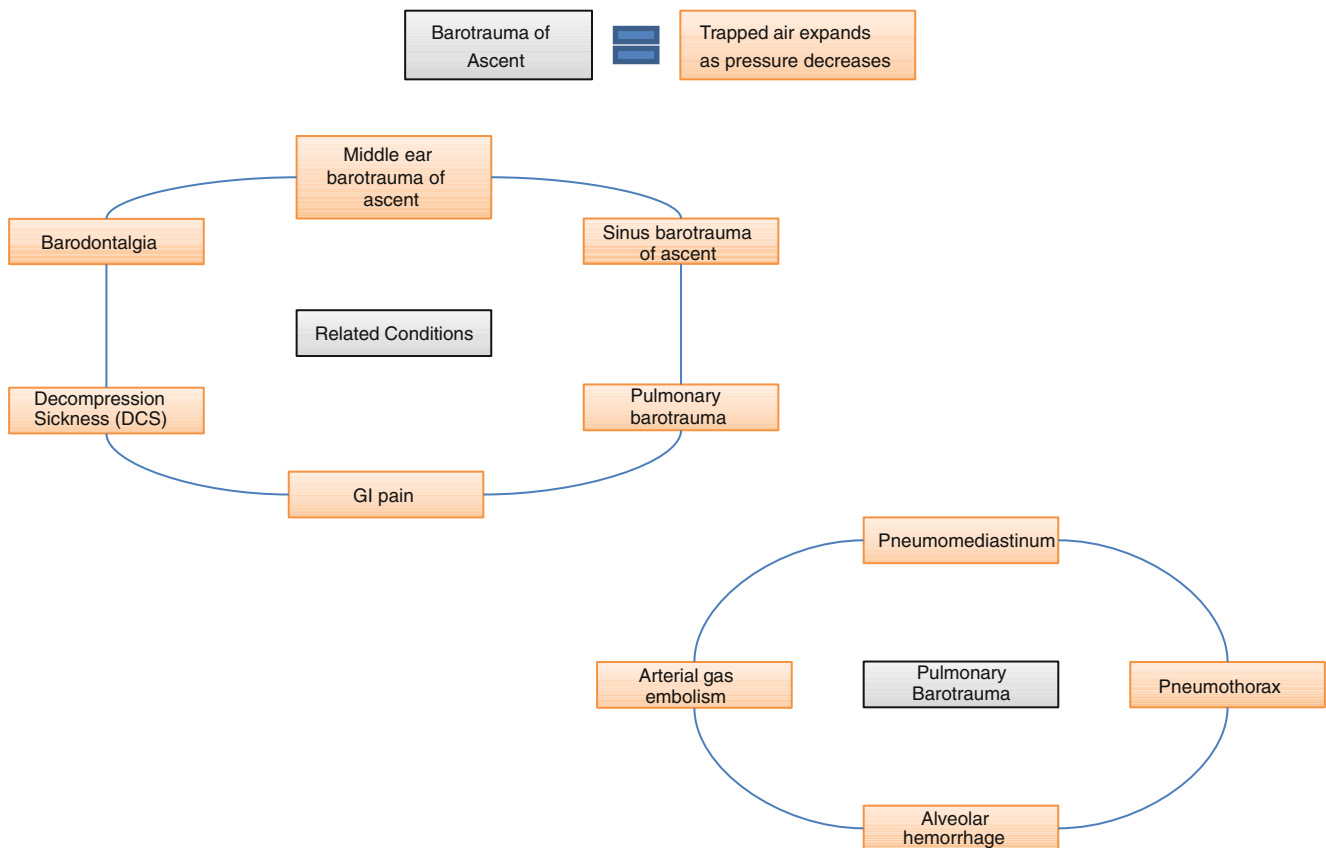
Barotrauma of Descent: Barotitis Externa



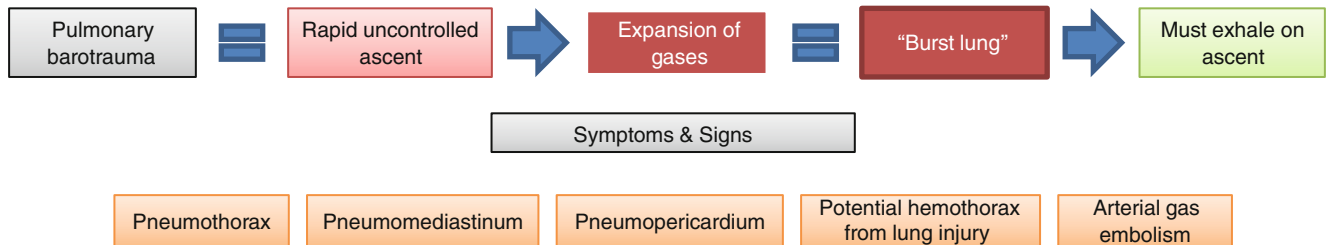
Sinus Barotrauma



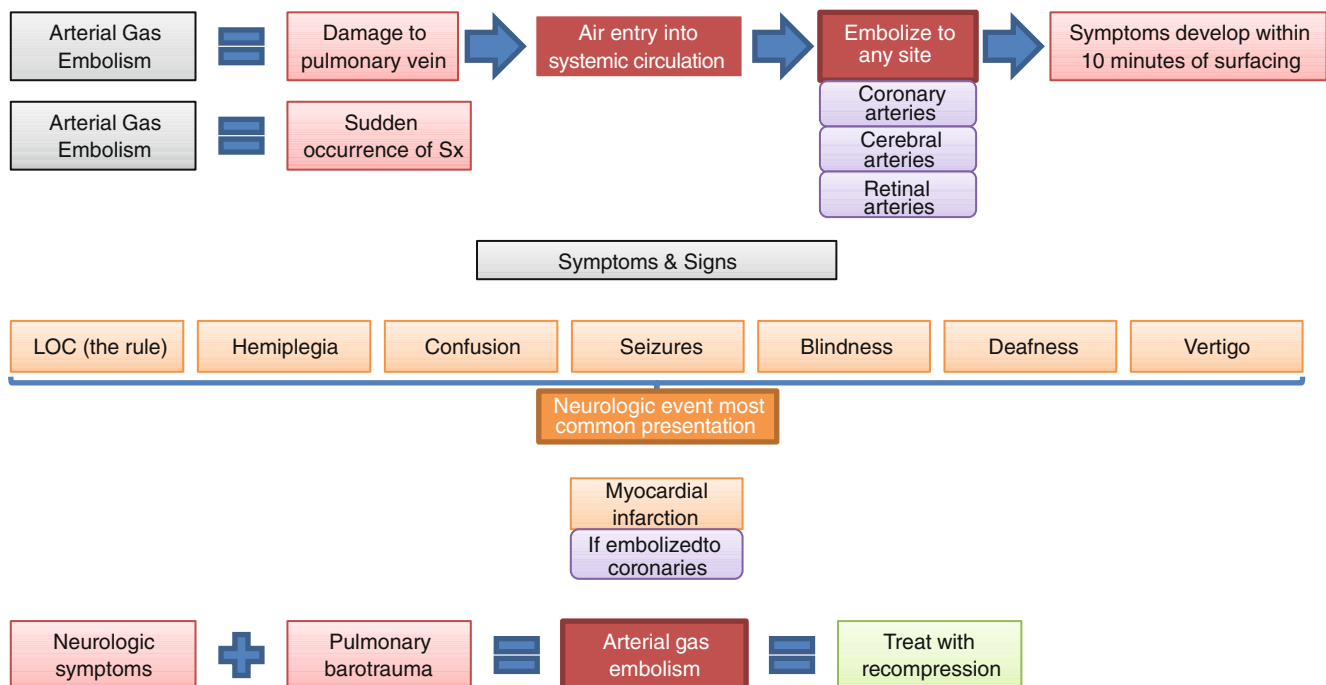
Barotrauma of Ascent



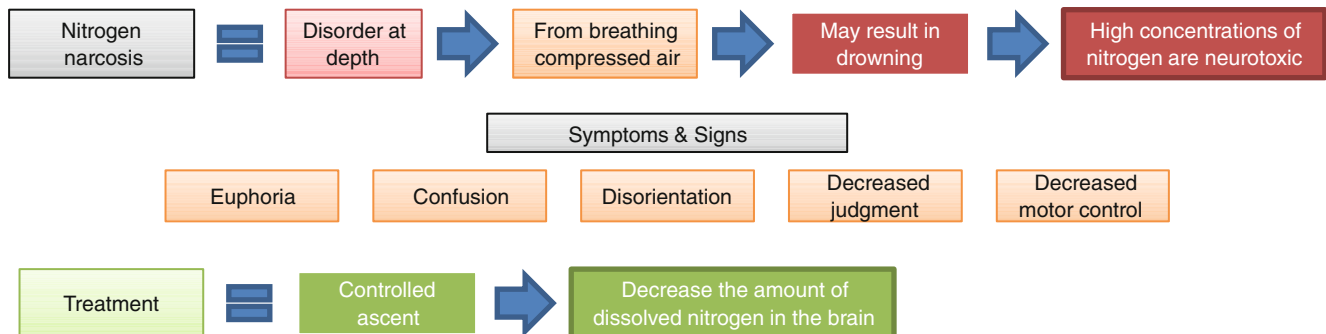
Pulmonary Barotrauma



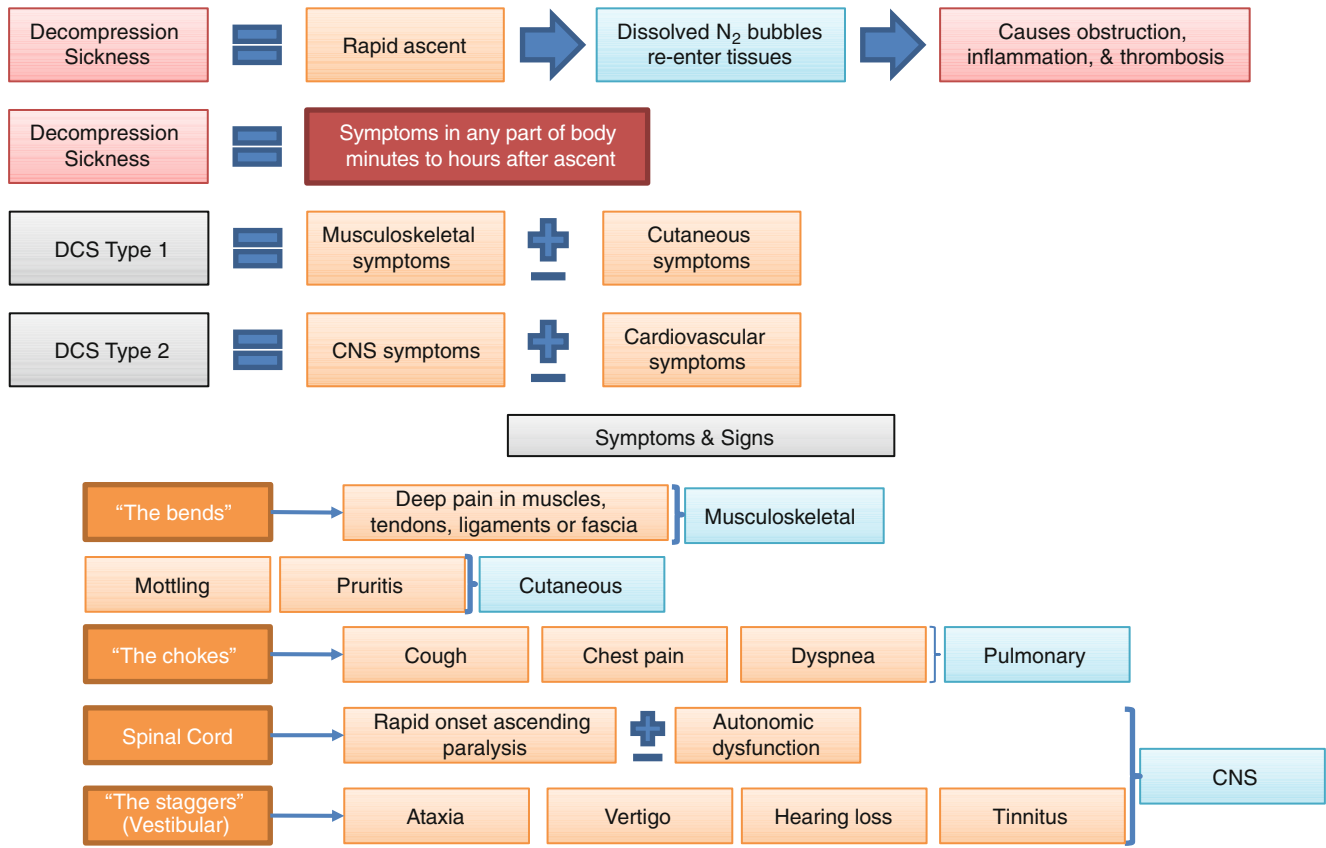
Arterial Gas Embolism



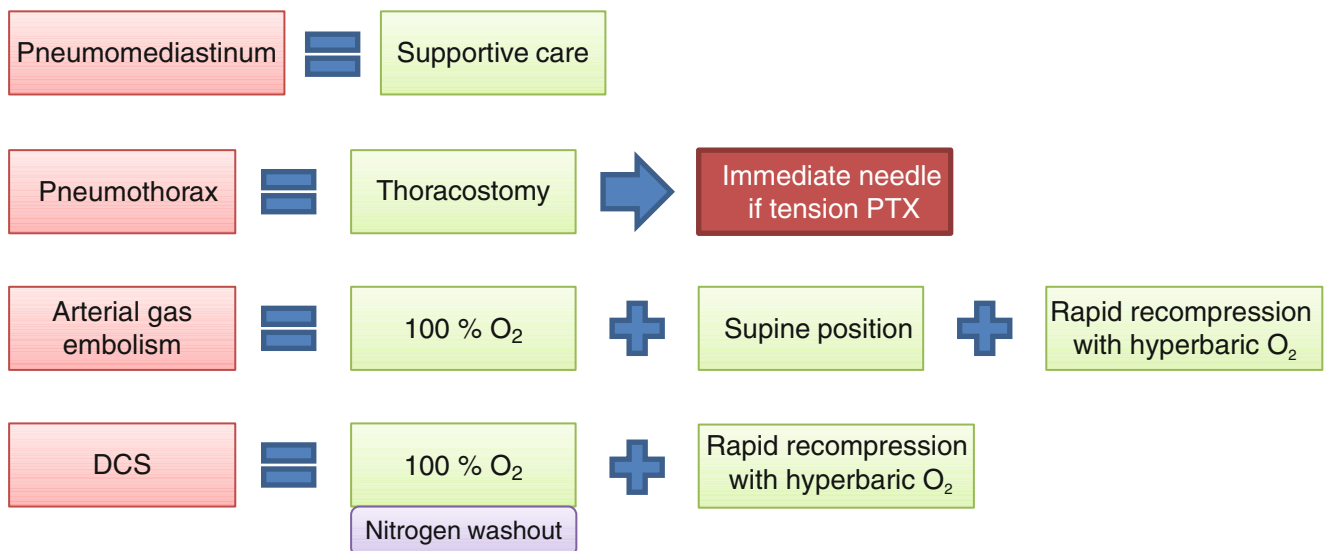
Nitrogen Narcosis



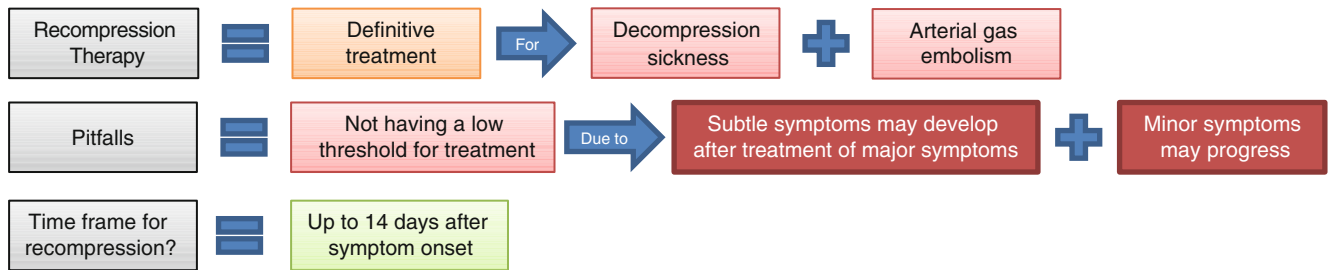
Decompression Sickness



Barotrauma of Ascent Treatment

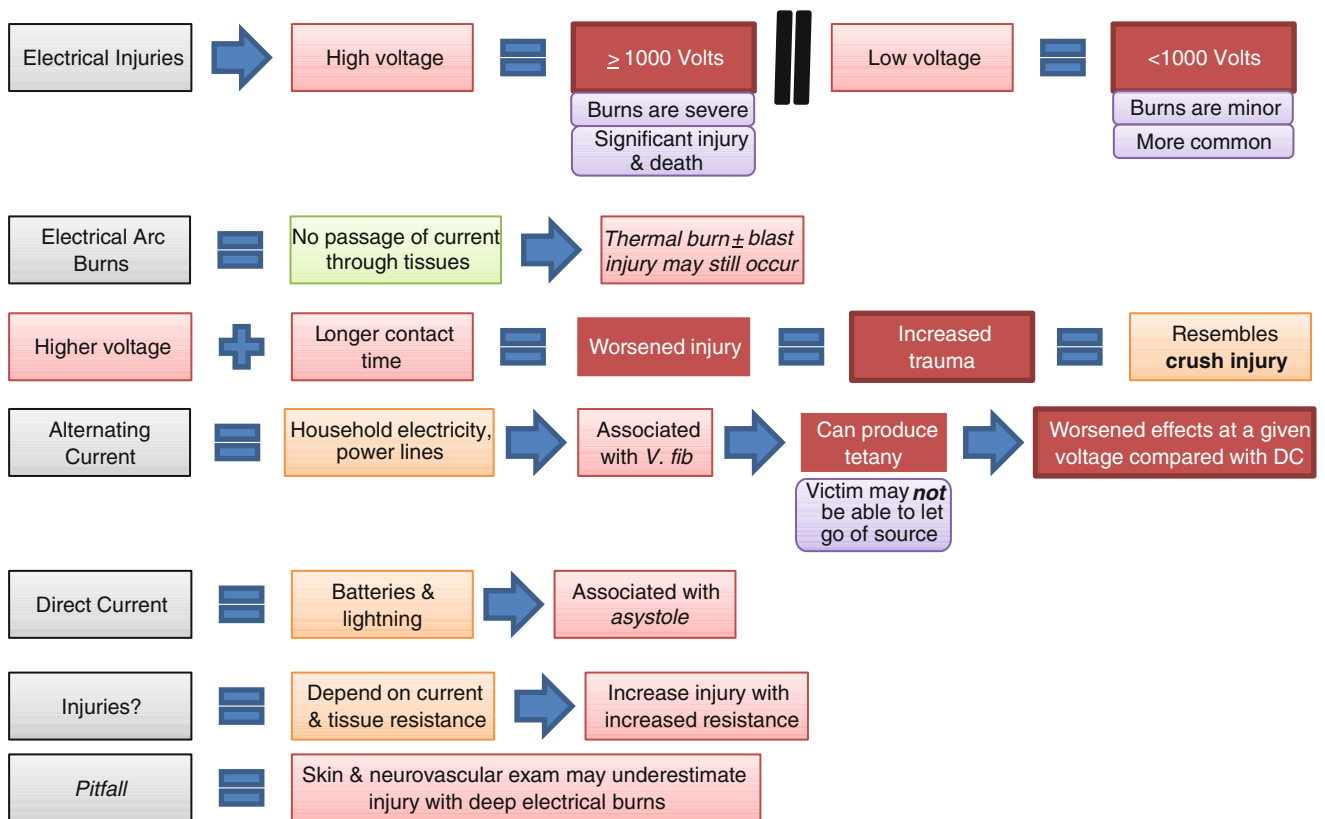


Recompression Therapy

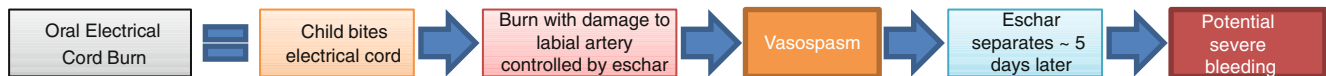
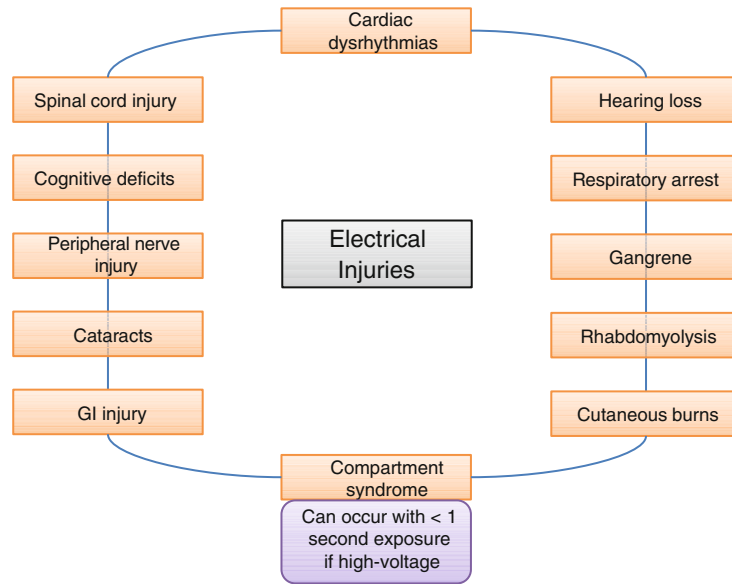


Electrical Injuries

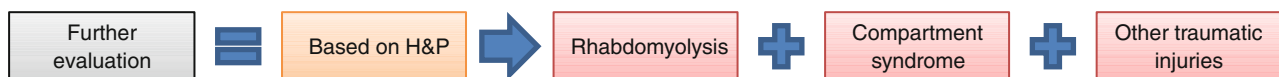
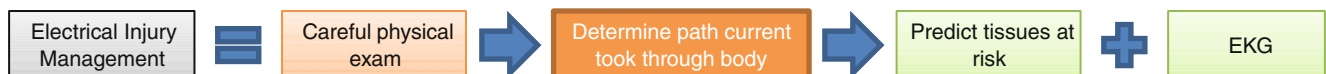
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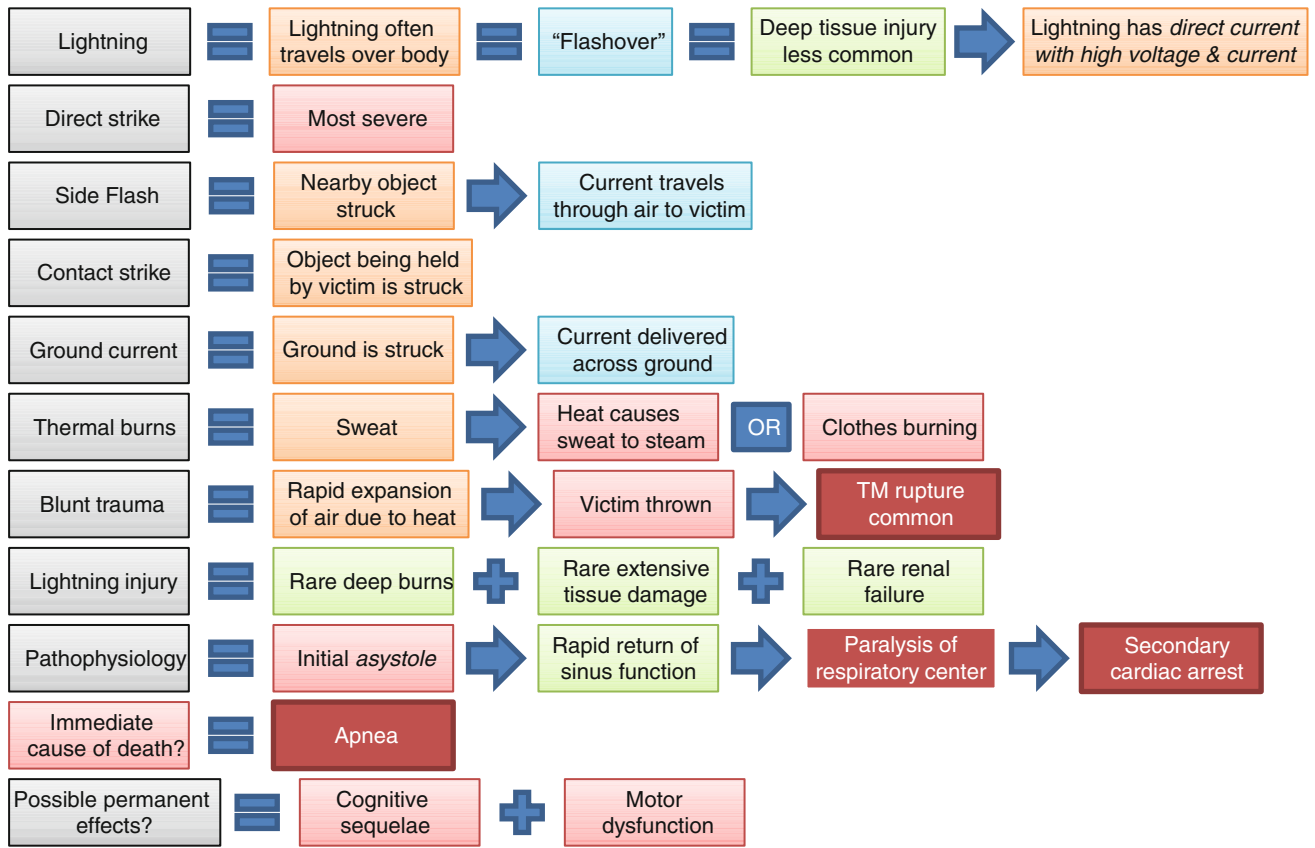
Electrical Injuries



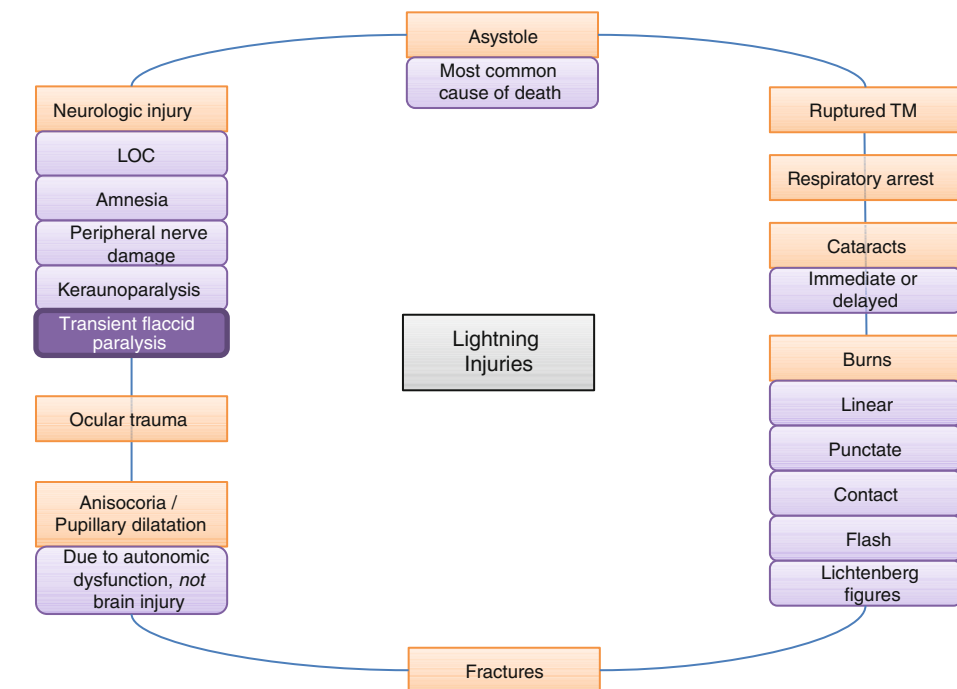
Electrical Injury Management



Lightning Injury



Lightning Injuries

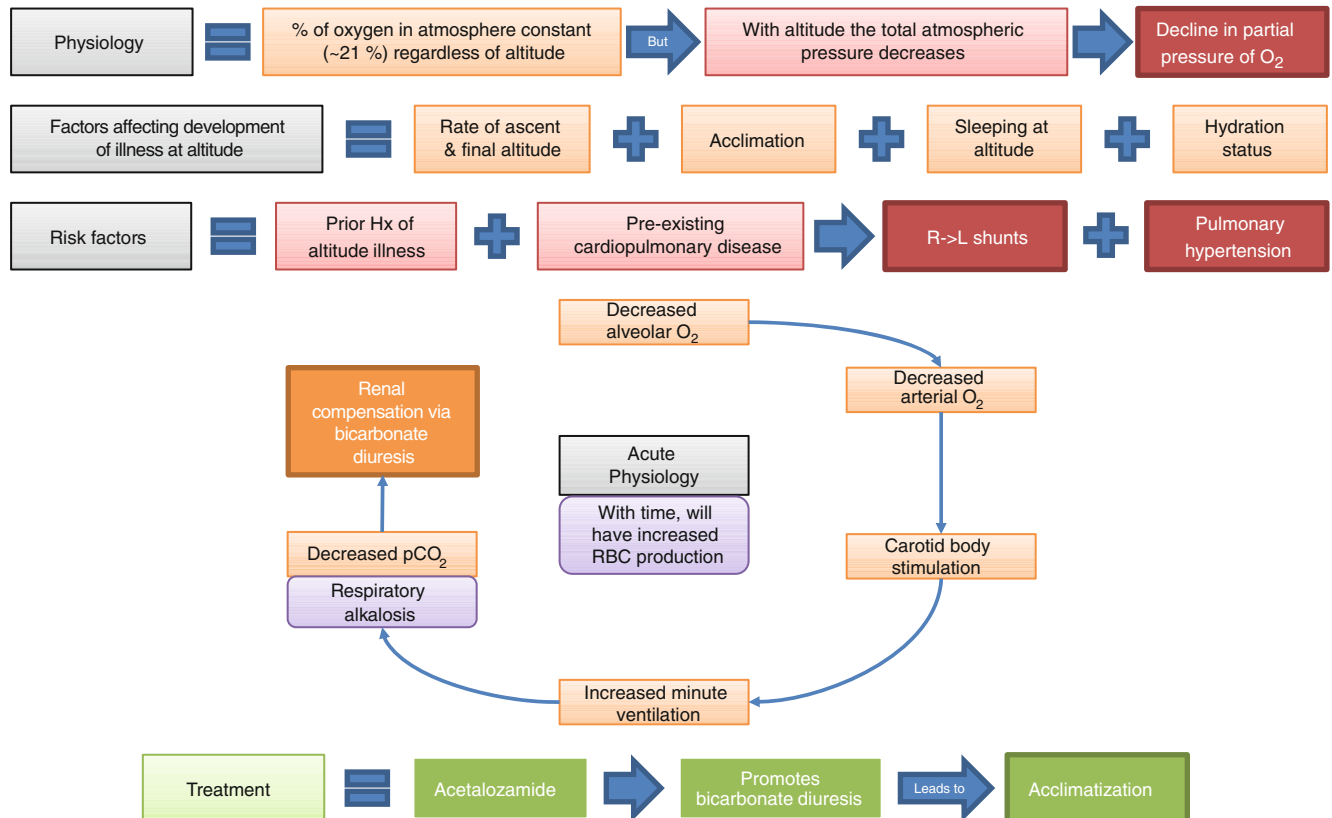


Lightning Injury Management

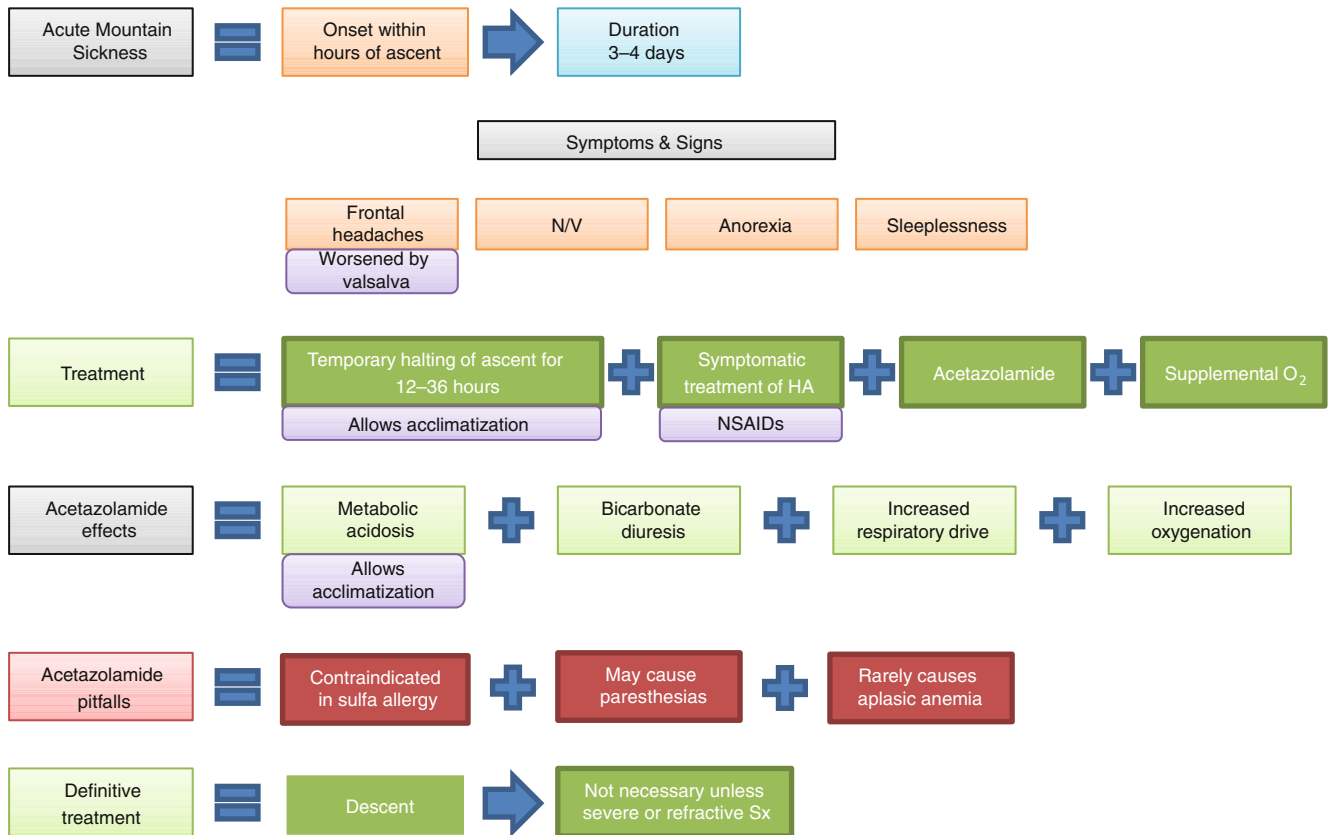


High-Altitude Illness

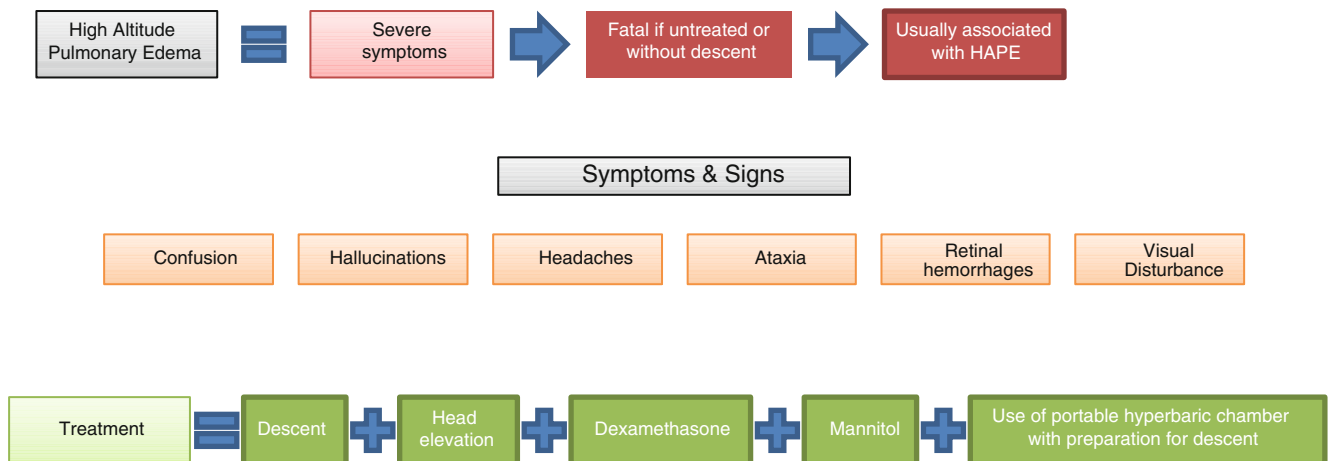
Introduction



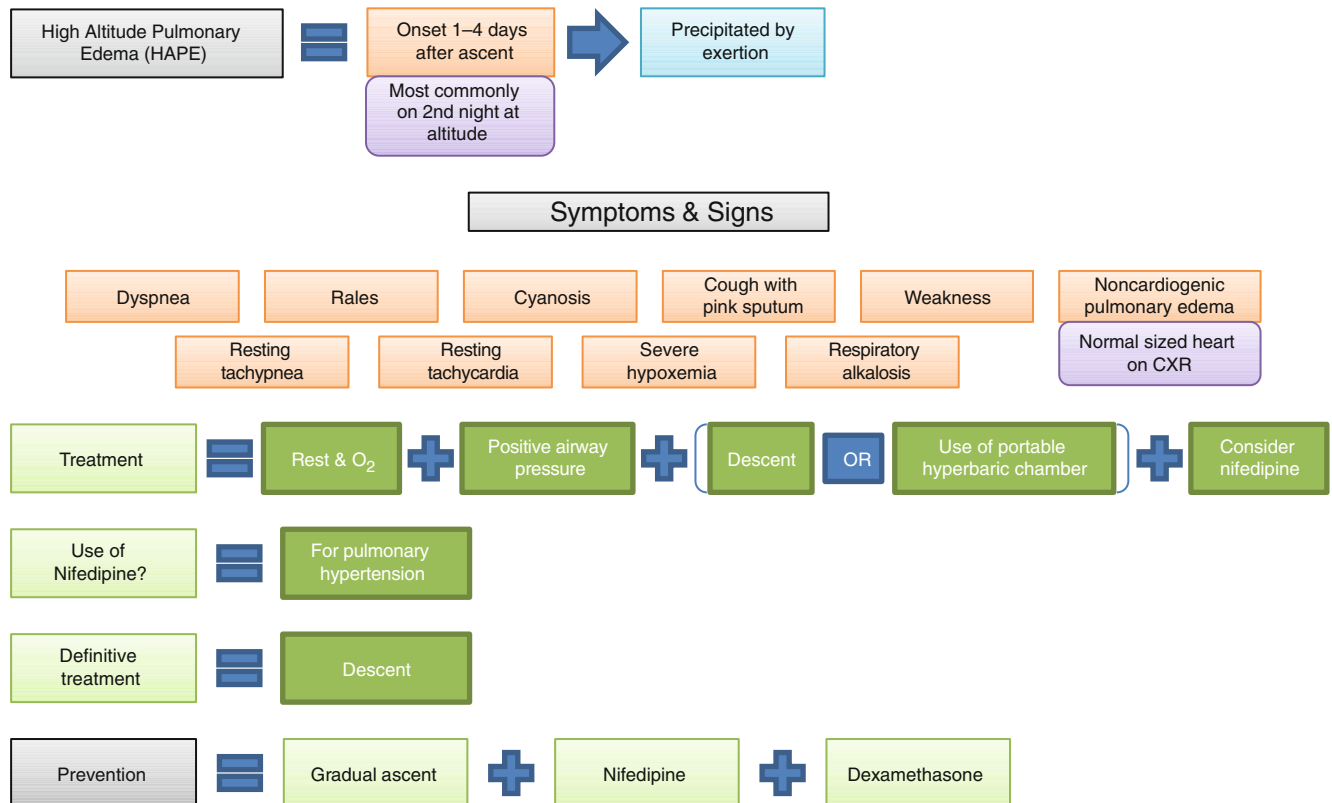
Acute Mountain Sickness



High-Altitude Cerebral Edema

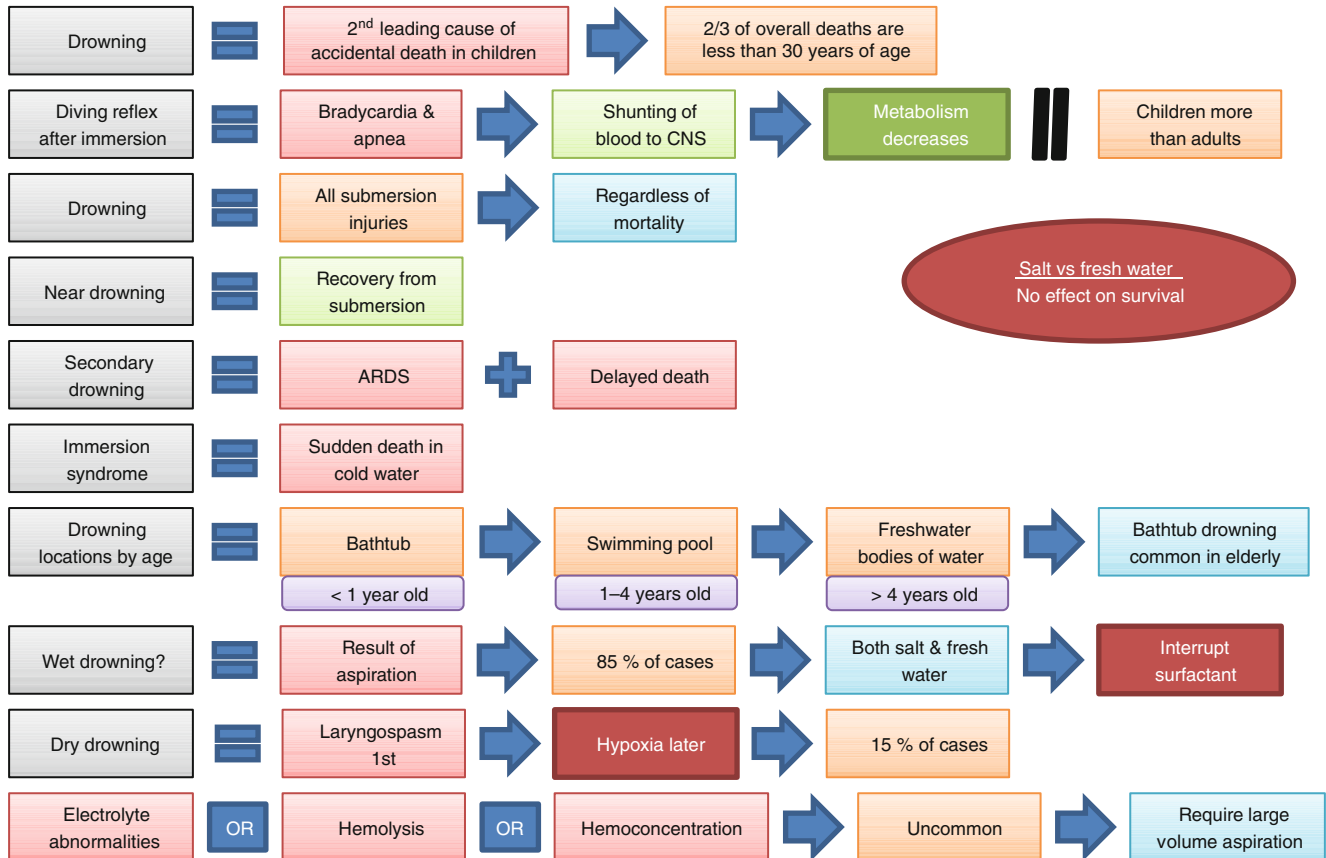


High-Altitude Pulmonary Edema

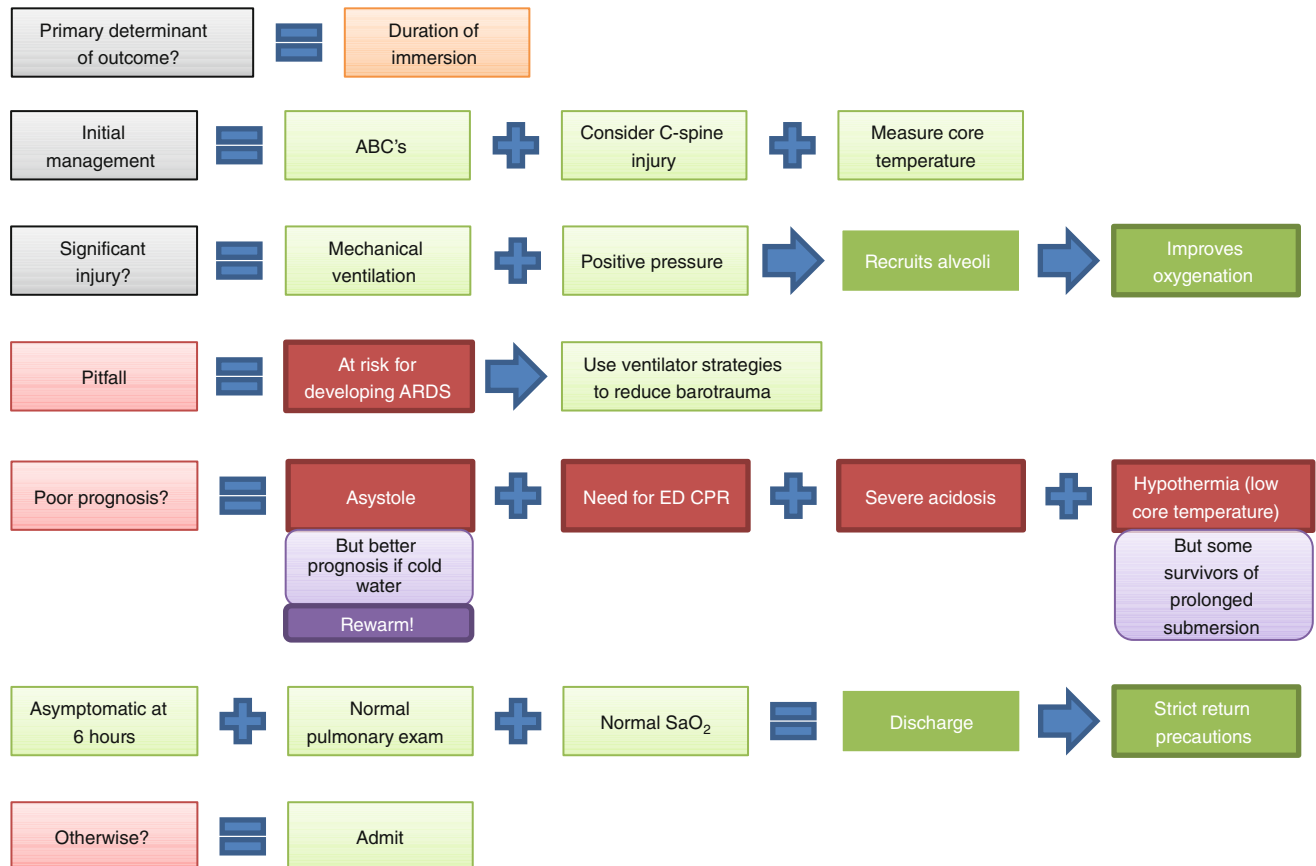


Submersion

Drowning

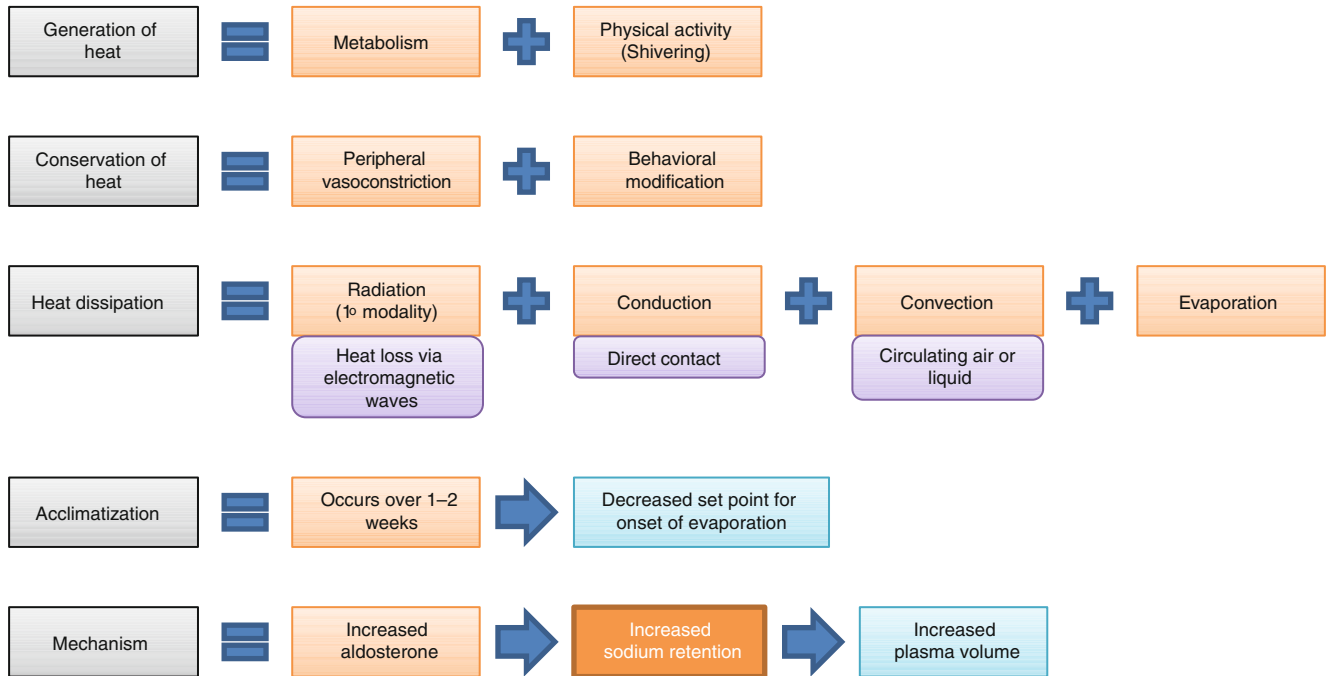


Drowning Management

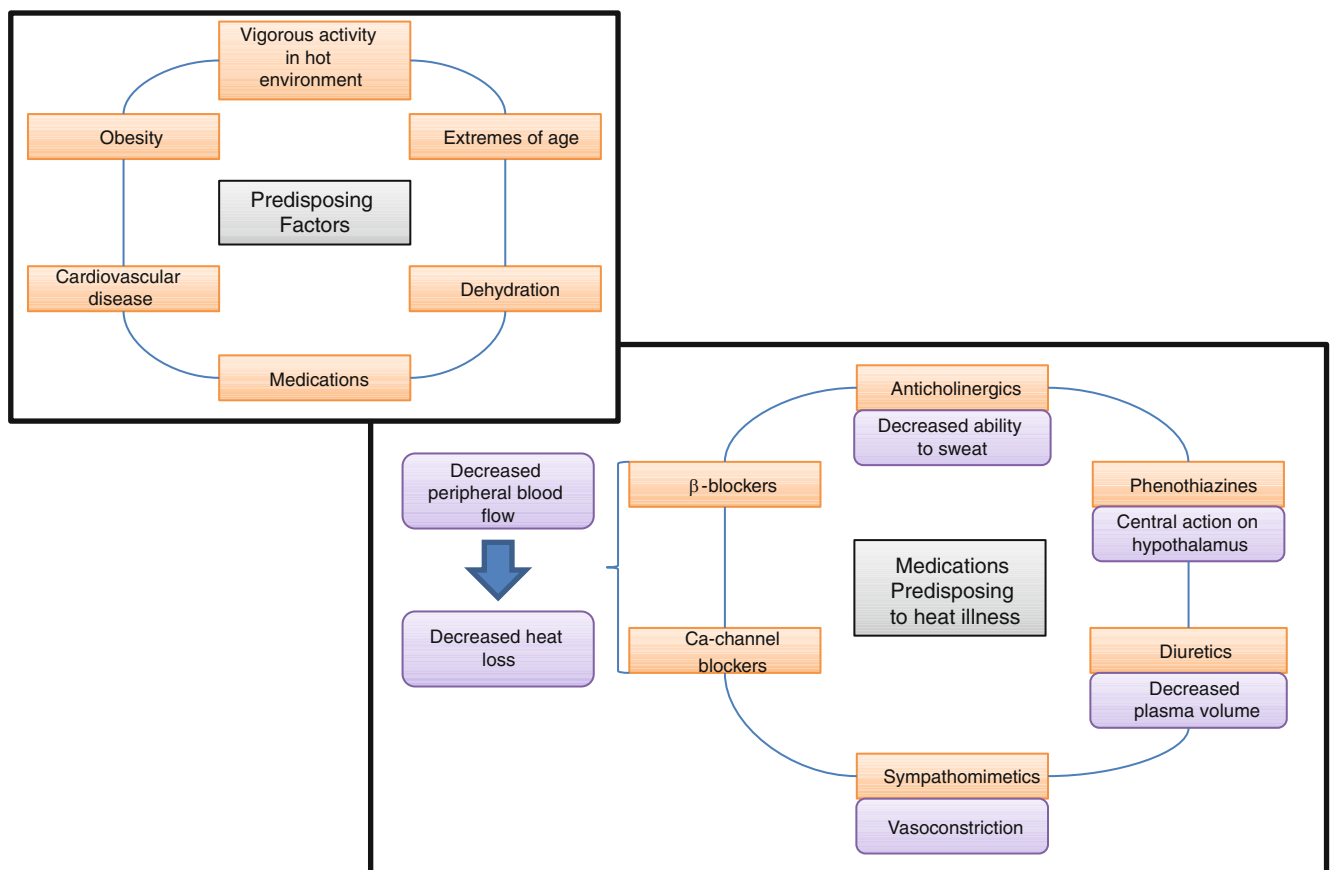


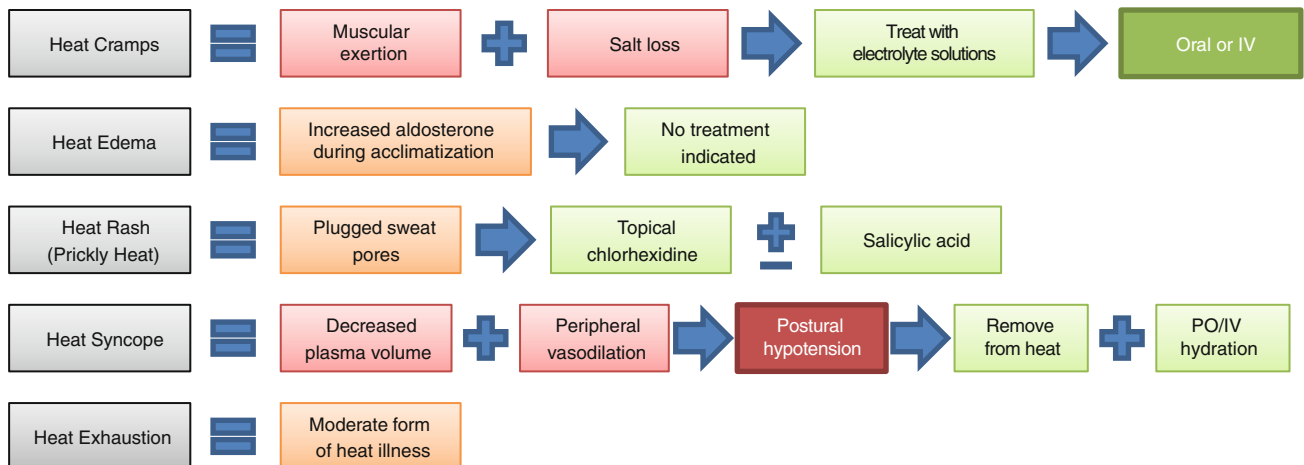
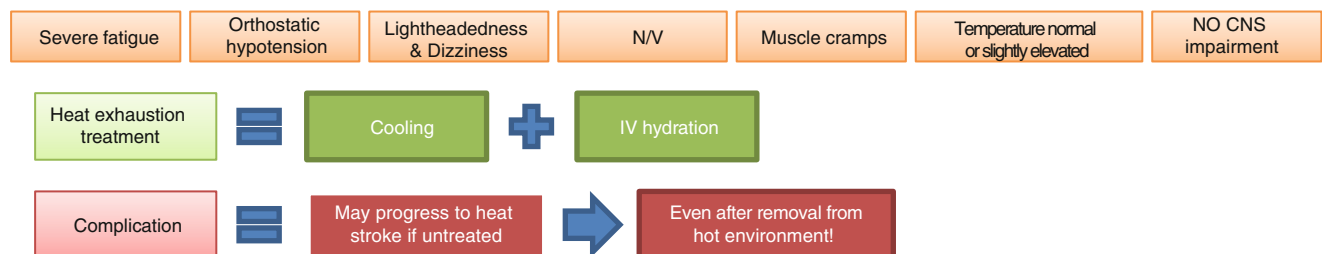
Temperature-Related Illness

Heat Dissipation Versus Generation

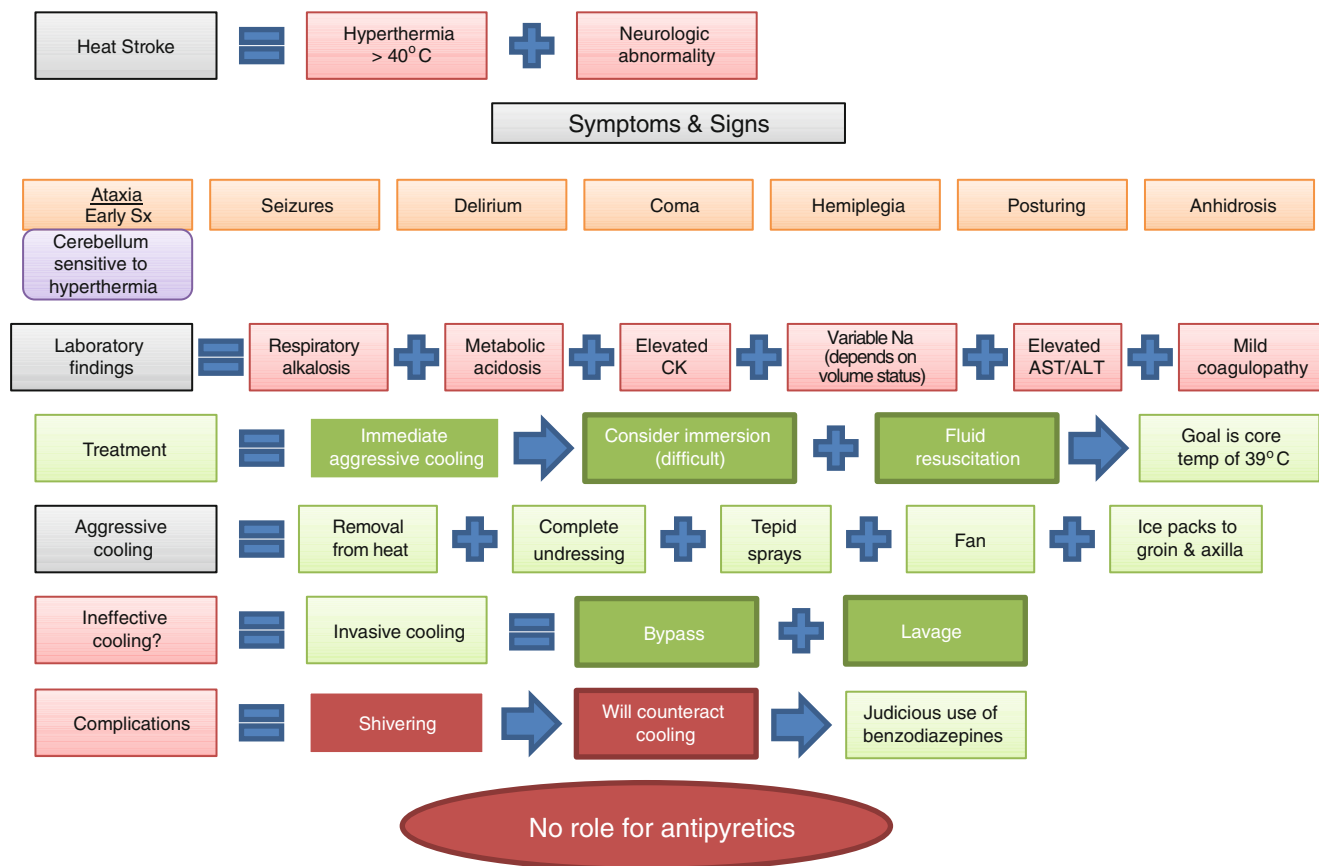


Predisposing Factors for Heat Illness

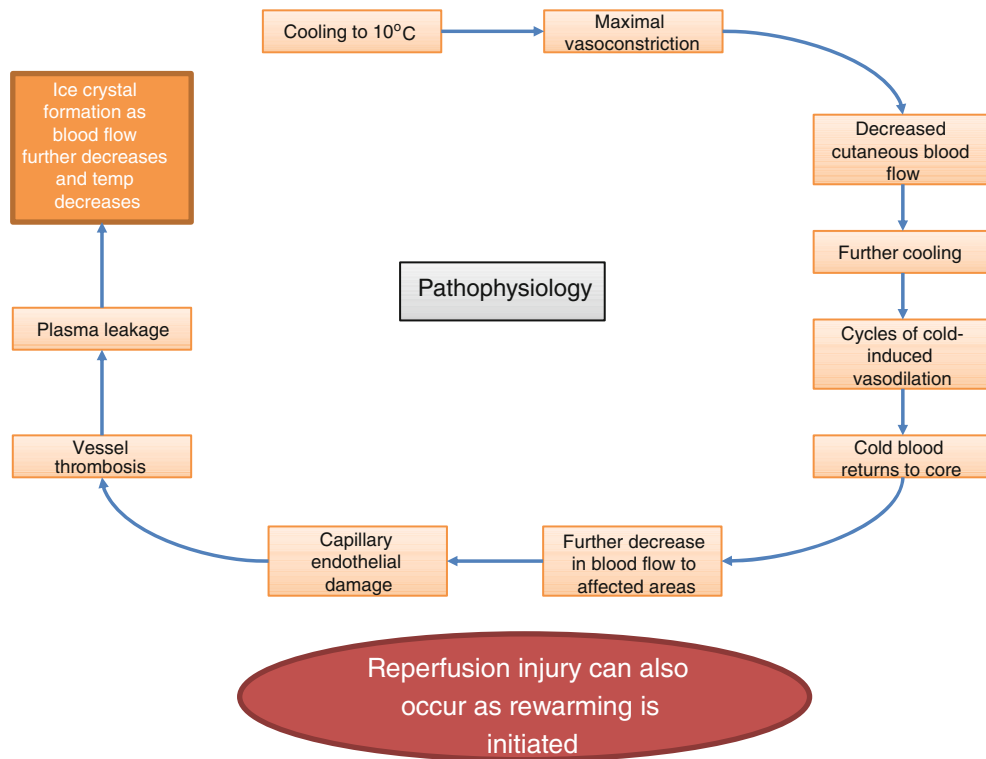


Minor/Moderate Heat Illness**Symptoms & Signs of Heat Exhaustion**

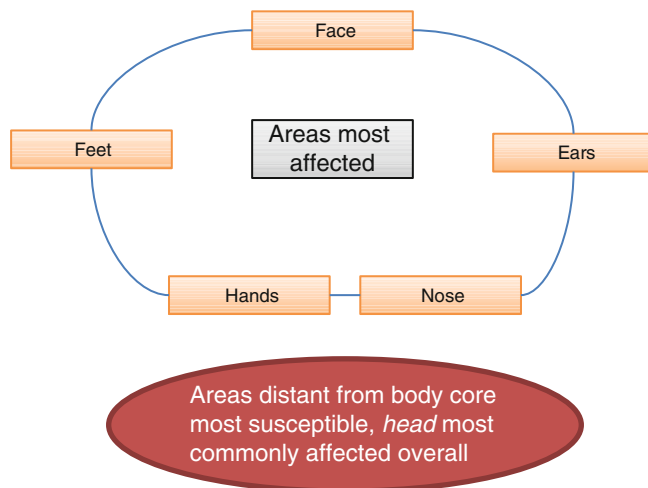
Heat Stroke

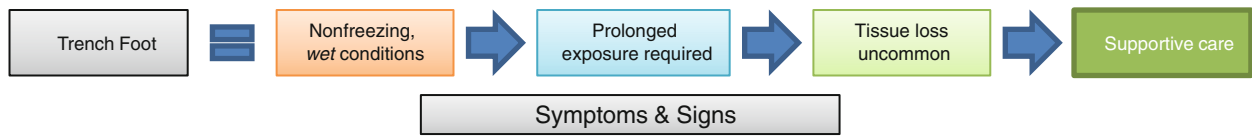


Cold Injury Pathophysiology



Localized Cold Injuries

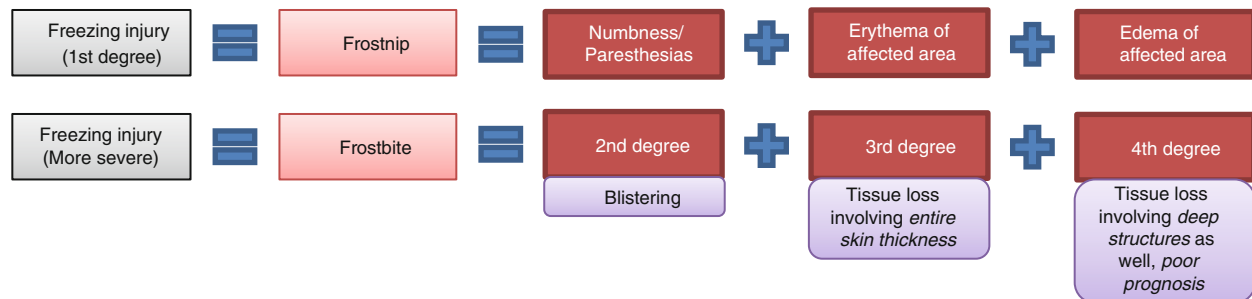




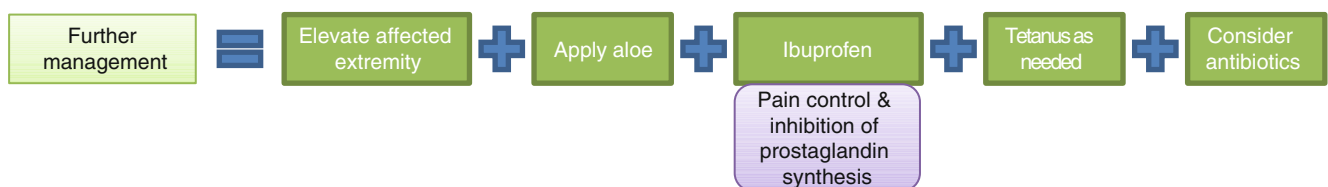
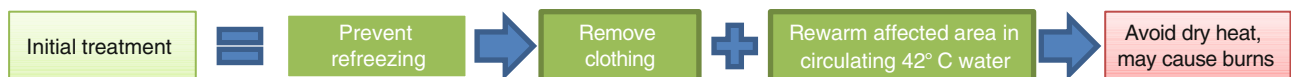
Symptoms & Signs



Grading of severity
difficult visually for
several weeks post
injury

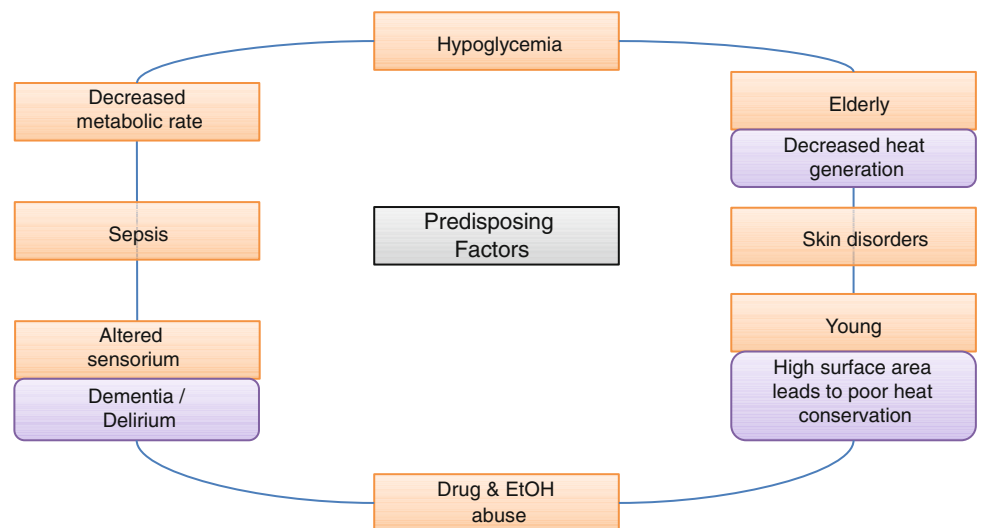


Management

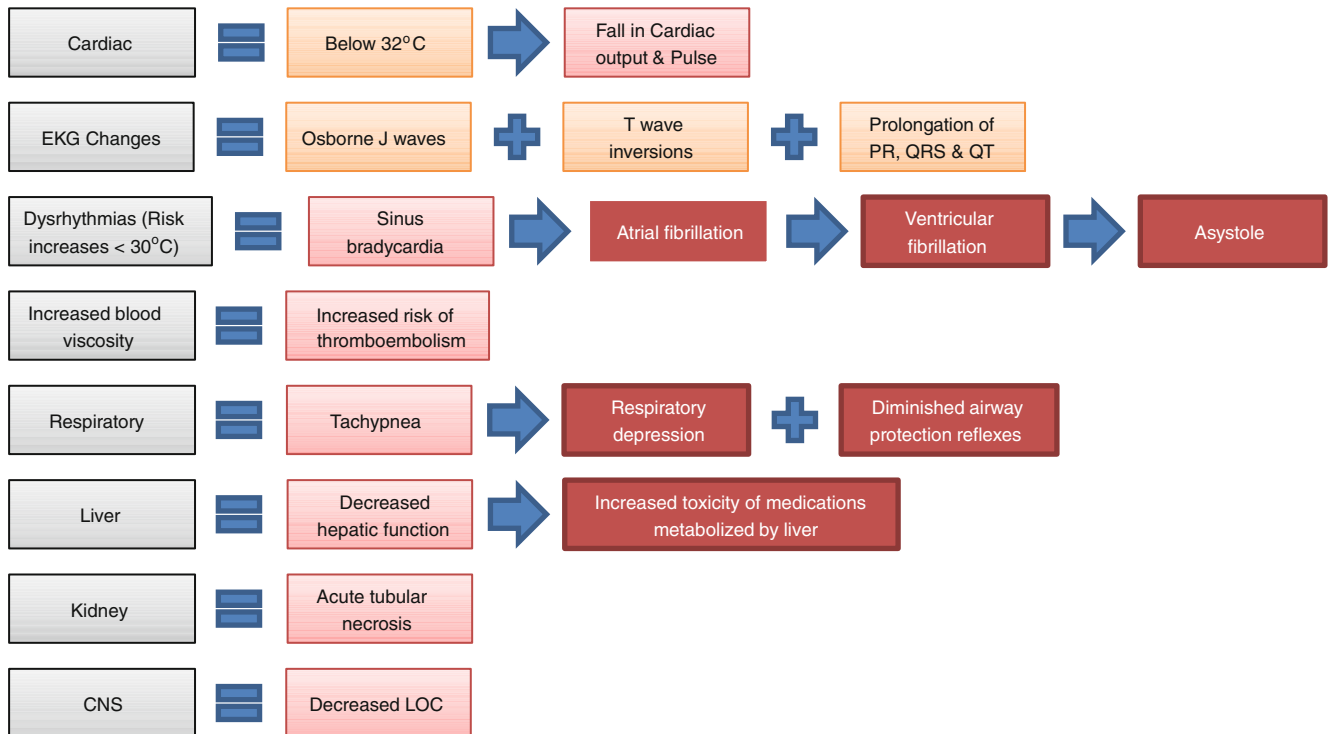


Avoid early surgical
intervention

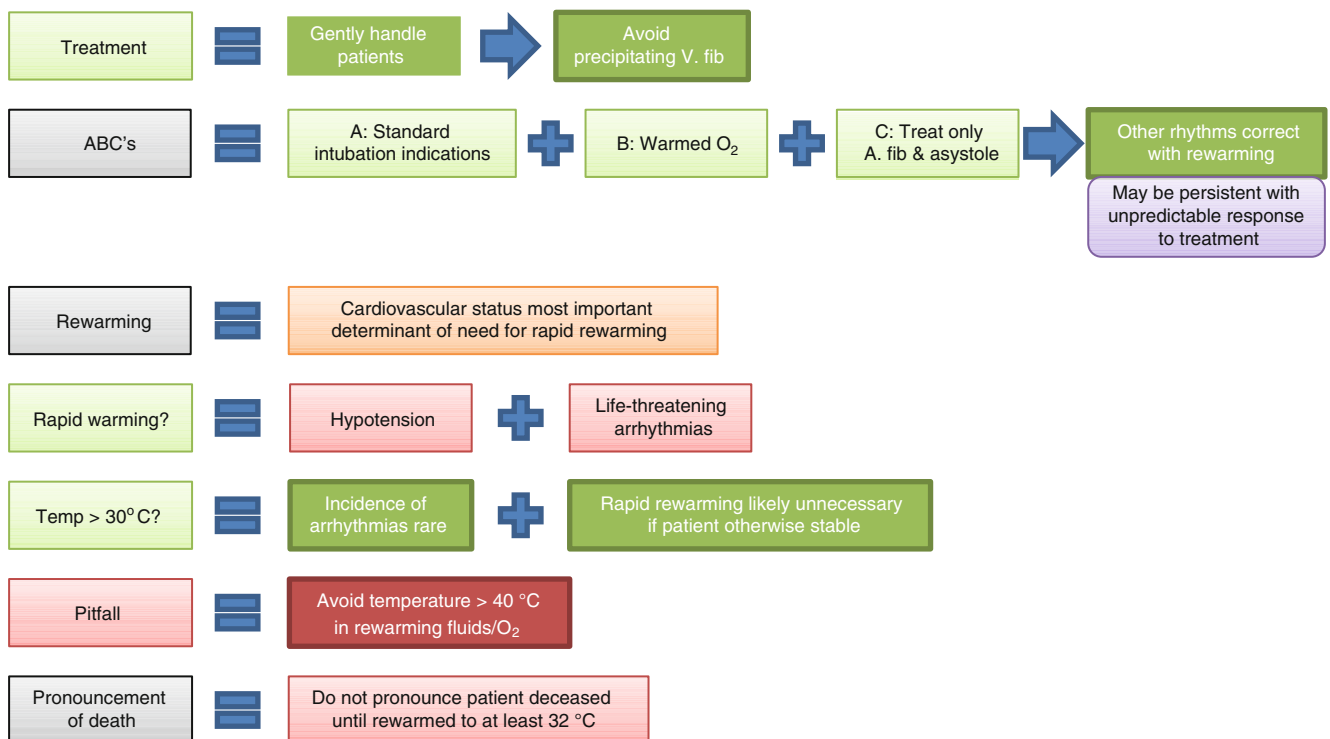
Hypothermia



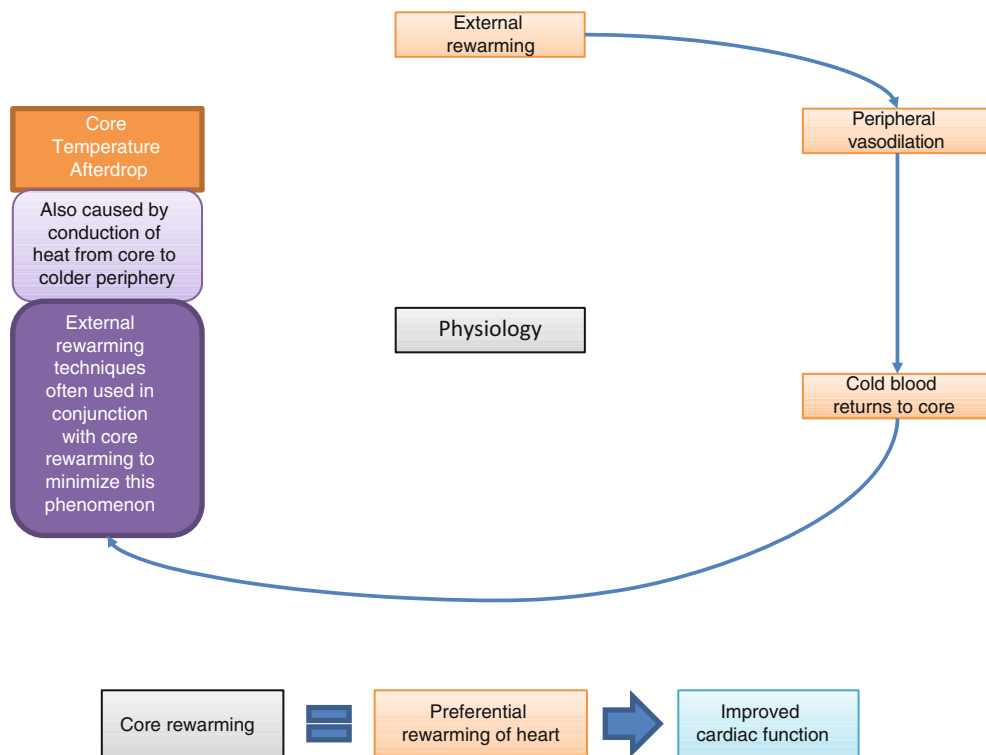
Hypothermia Manifestations



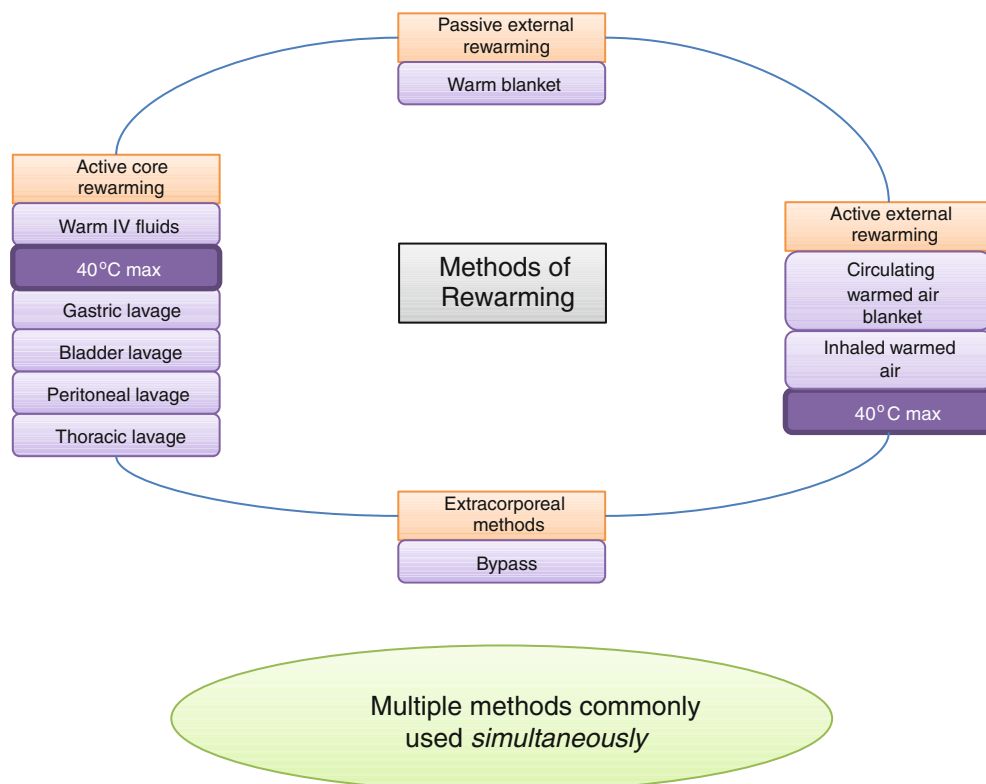
Hypothermia Treatment



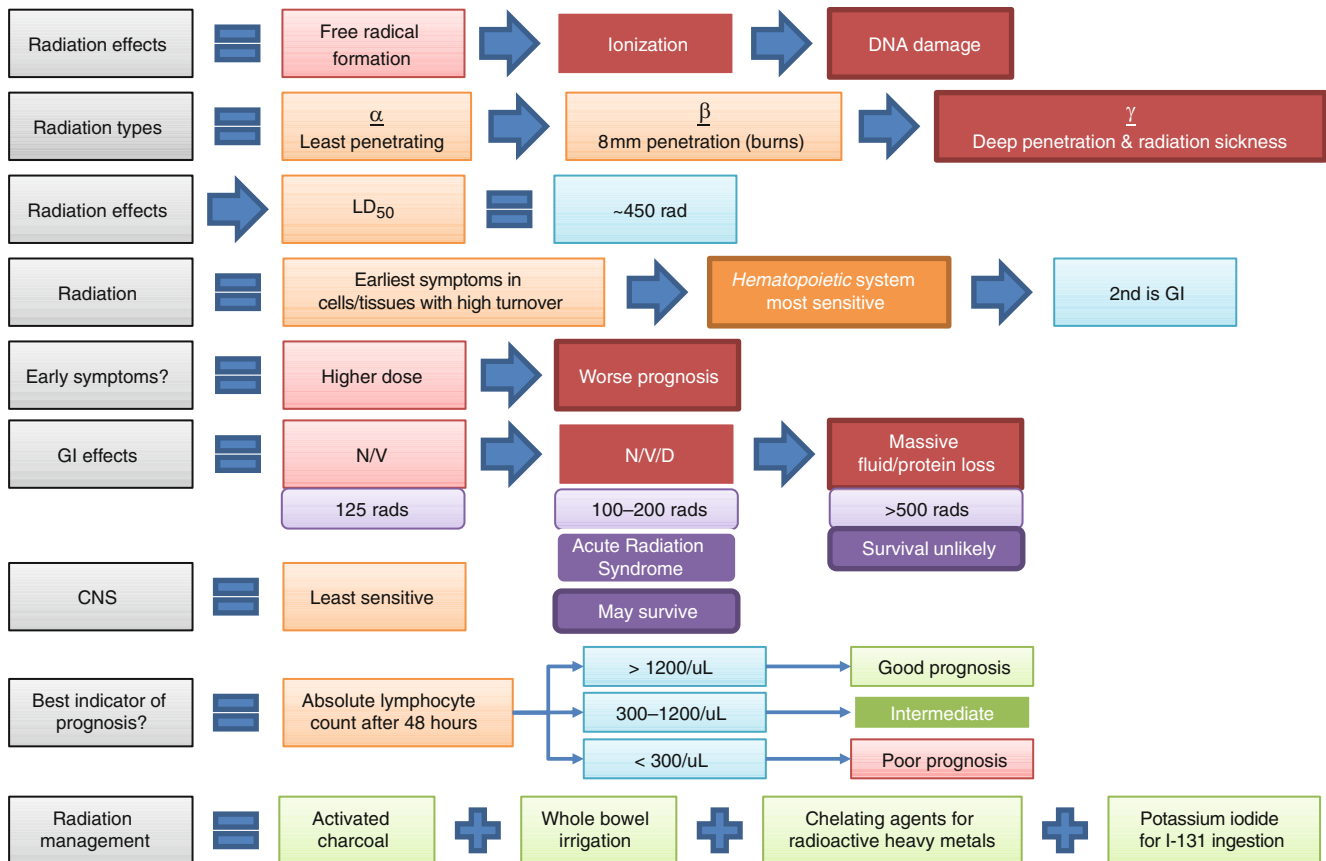
Rewarming Physiology



Rewarming Methods

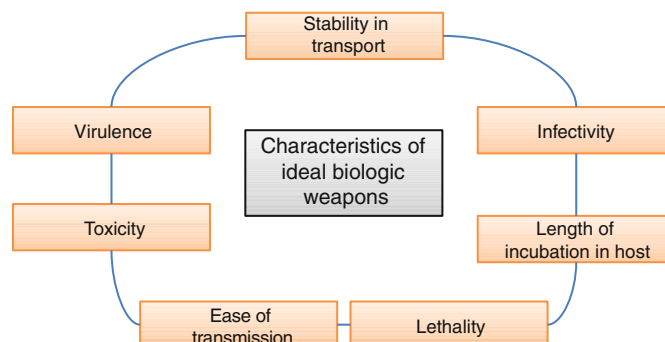


Radiation

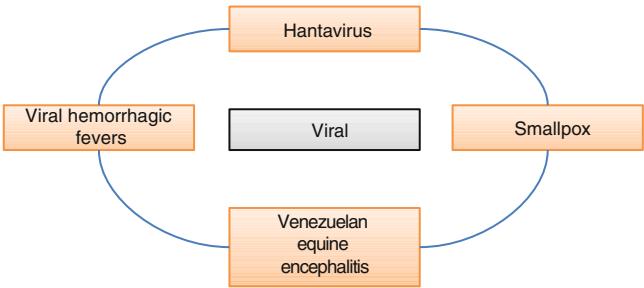
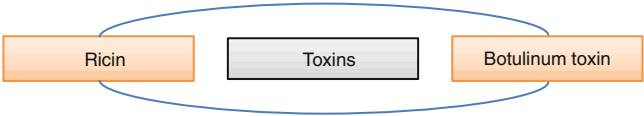
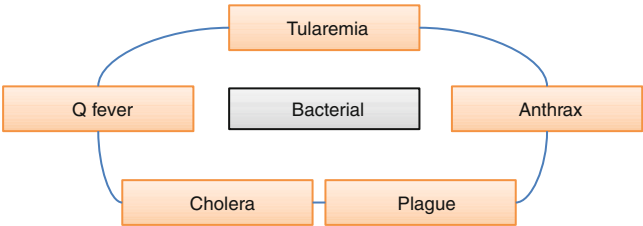


Biological Weapons

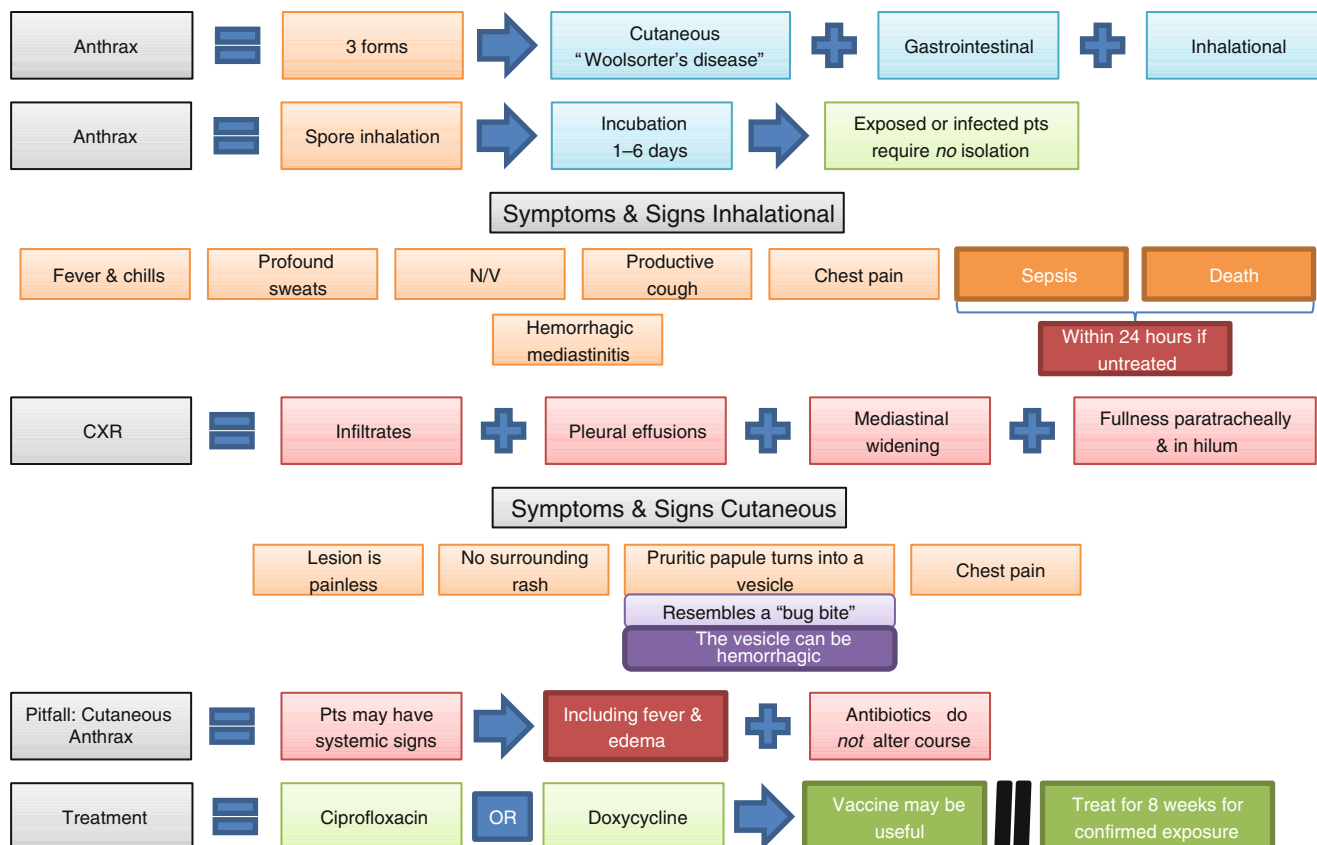
Biological Weapons Tidbits



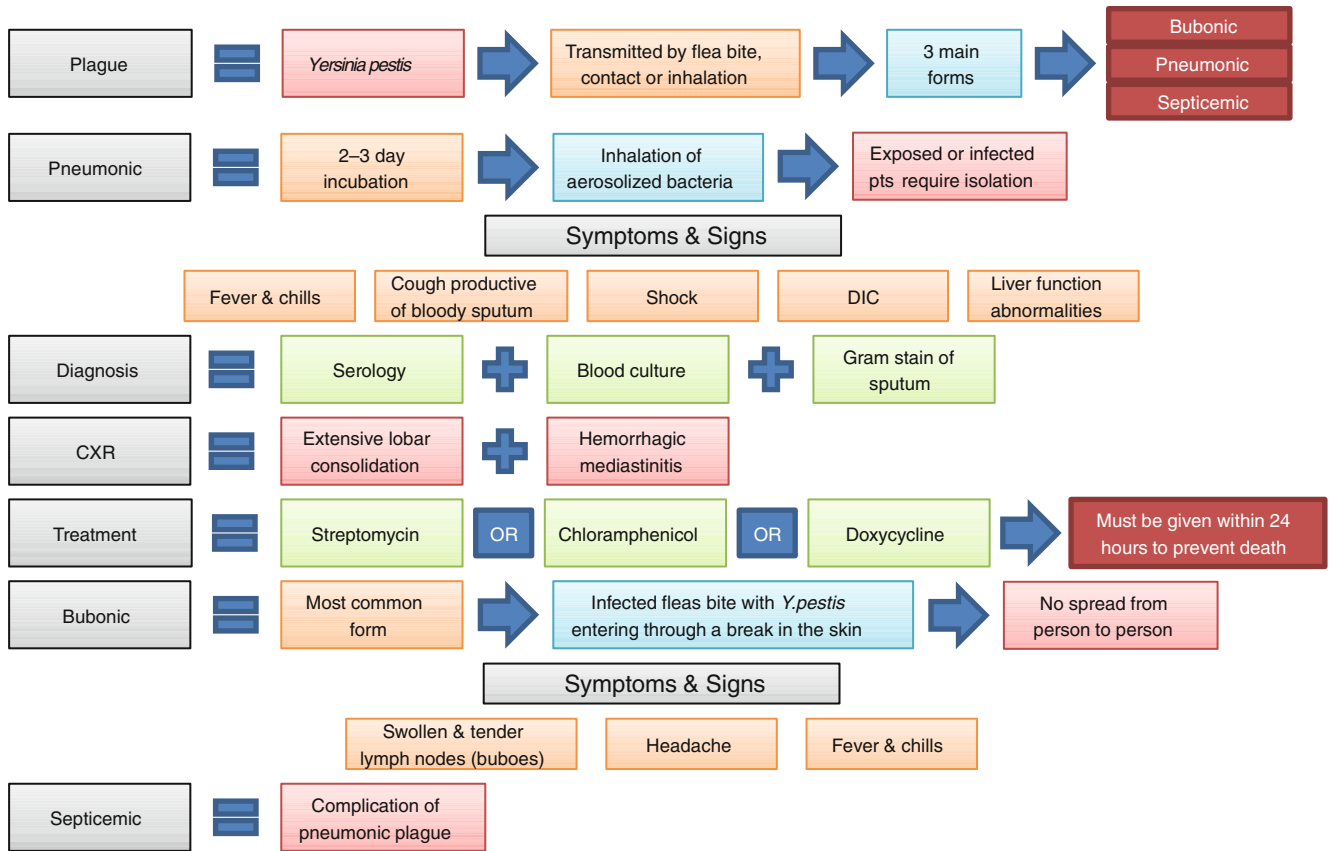
Selected Biological Agents and Toxins



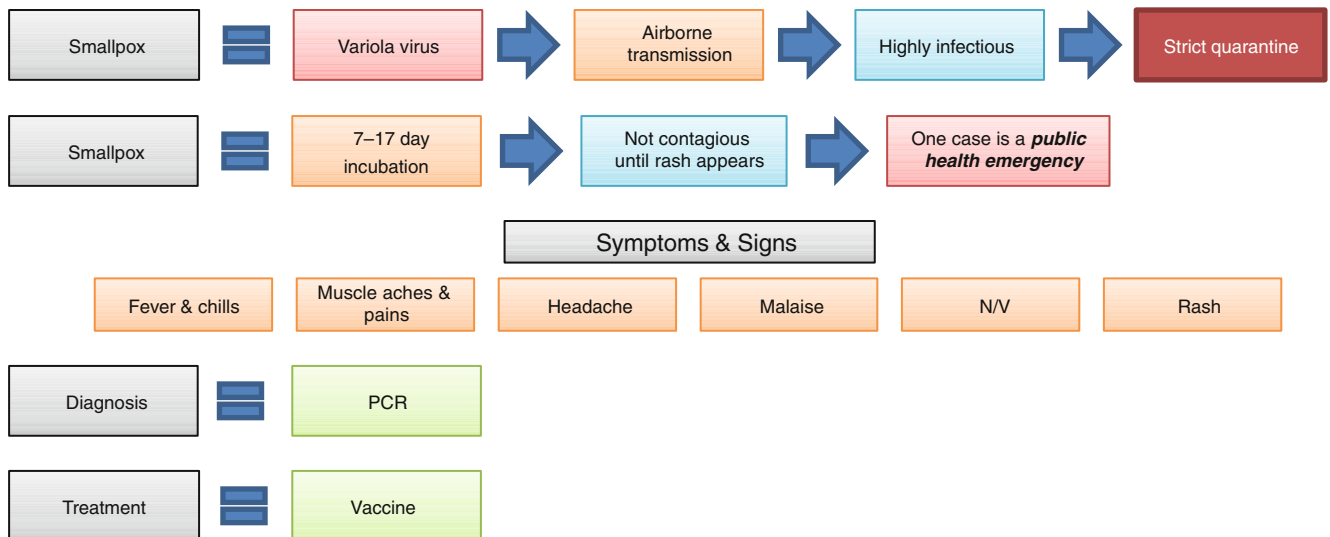
Anthrax



Plague



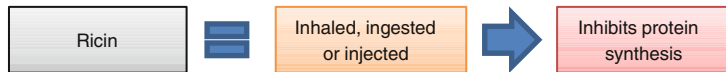
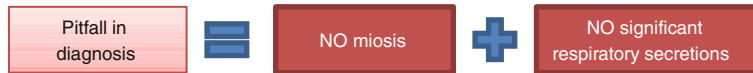
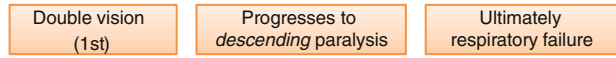
Smallpox



Toxins



Symptoms & Signs

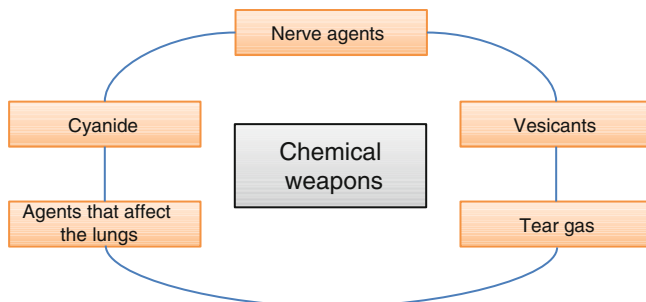


Symptoms & Signs



Chemical Weapons

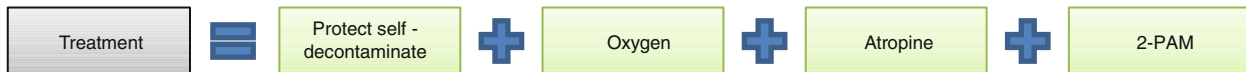
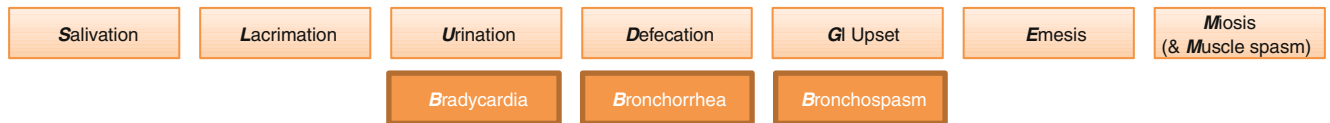
Chemical Weapons



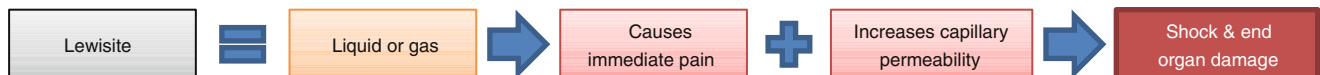
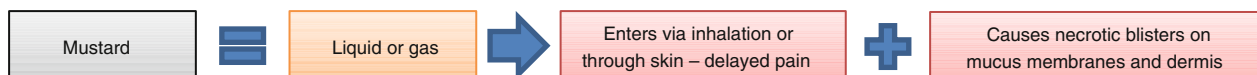
Nerve Agents



Symptoms & Signs – “SLUDGEM” & Killer B’s

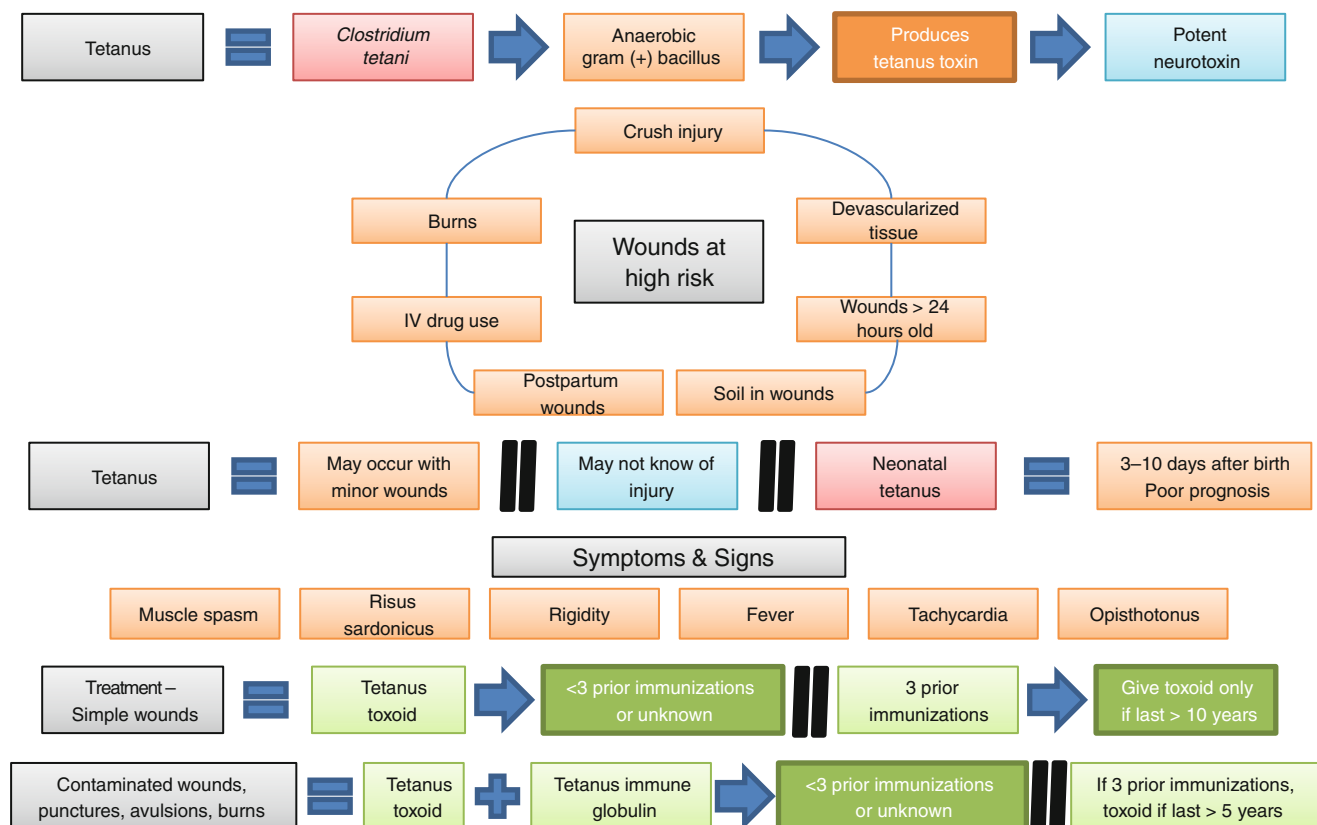


Vesicants



Tetanus

Tetanus



Neurologic Emergencies

Michael R. Marchick and Bobby Desai

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Dermatomes and Reflexes

Dermatomes & Reflexes

Dermatome	Area
C4	Clavicle
C6	Thumb
C7	Index finger
C8	Ring Finger
T4	Nipple Line
T10	Umbilicus
L1	Inguinal ligament
L2, 3	Medial thigh
L4	Knee
L5	Lateral calf
S1	Lateral foot
S2–4	Perianal
Reflexes	Area
C6	Biceps
C7	Triceps
L4	Patellar
S1	Achilles

Altered Mental Status and Coma

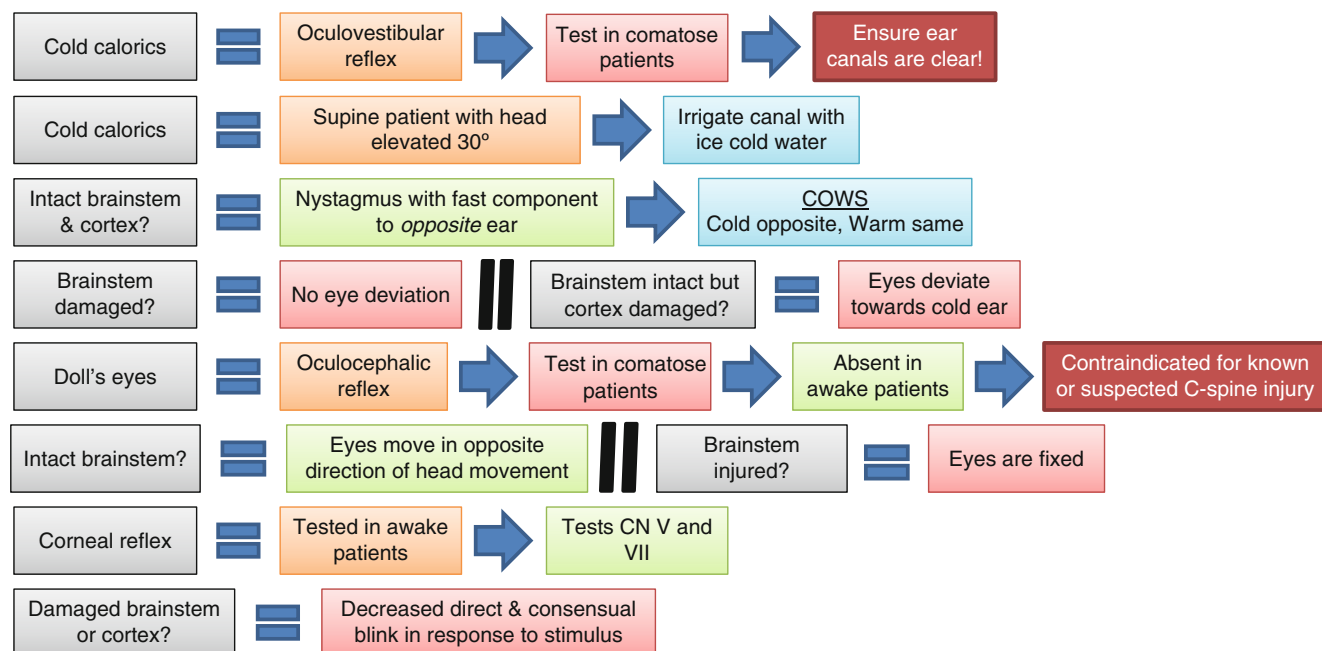
Altered Mental Status



AEIOU-TIPS

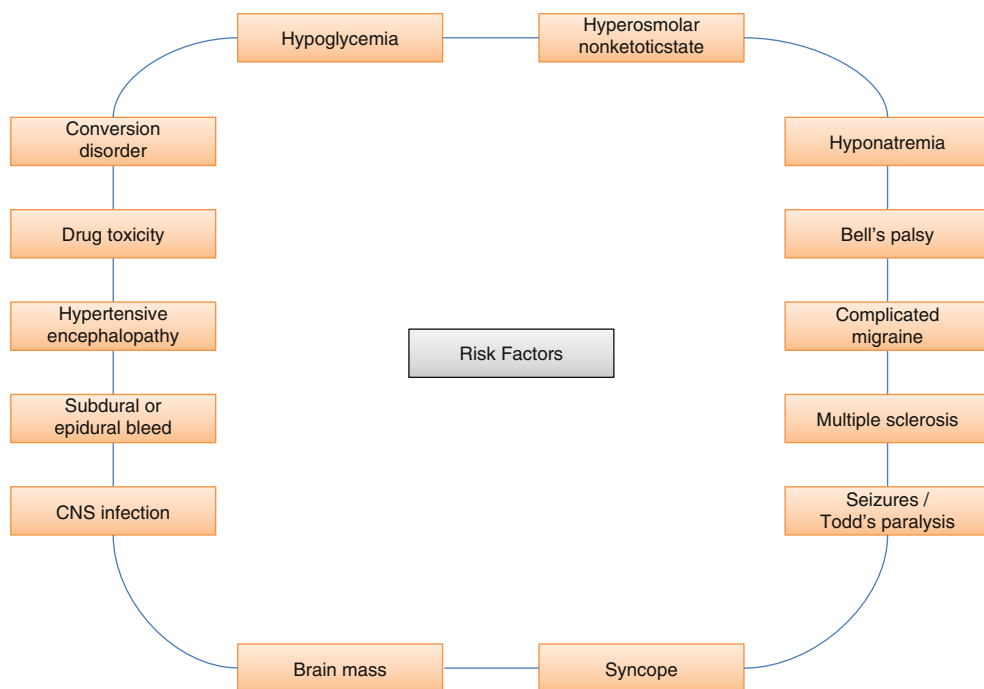
A	Alcohol, Acidosis
E	Epilepsy, Endocrine, Electrolytes, Encephalopathy
I	Insulin
O	Opiates, Overdose
U	Uremia
T	Trauma, Temperature
I	Infection
P	Poisoning, Psychiatric
S	Stroke, Shock

Coma Testing

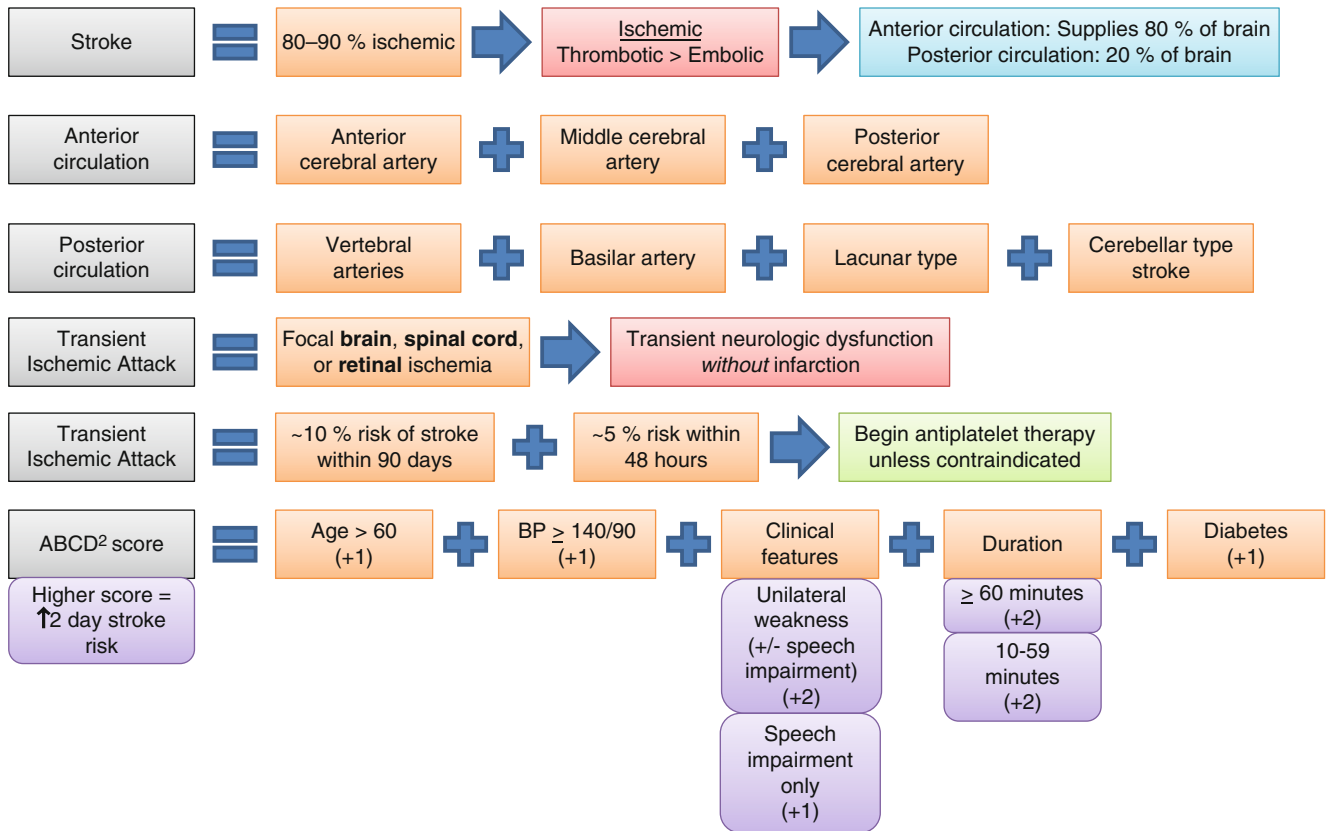


Cerebrovascular Accidents

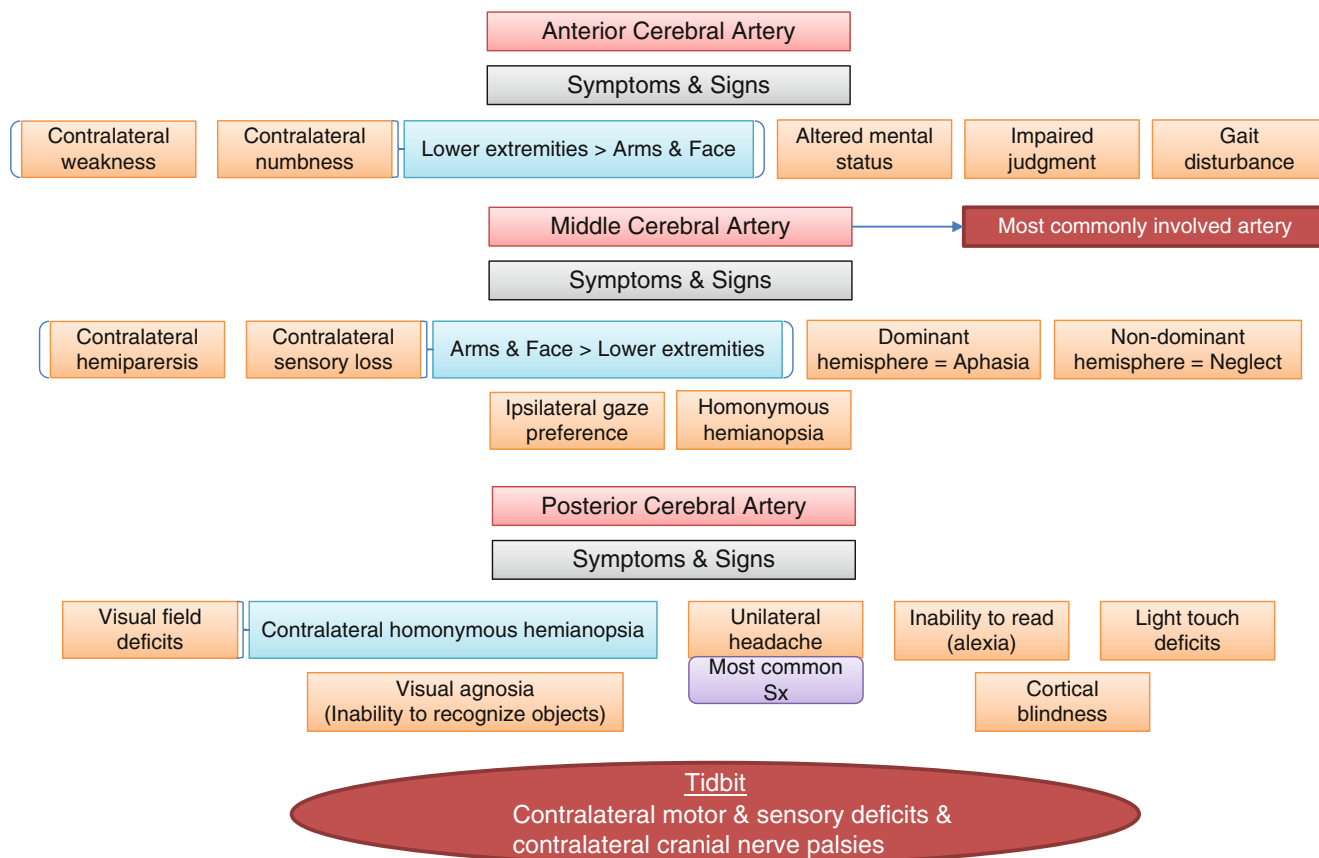
Stroke Mimics



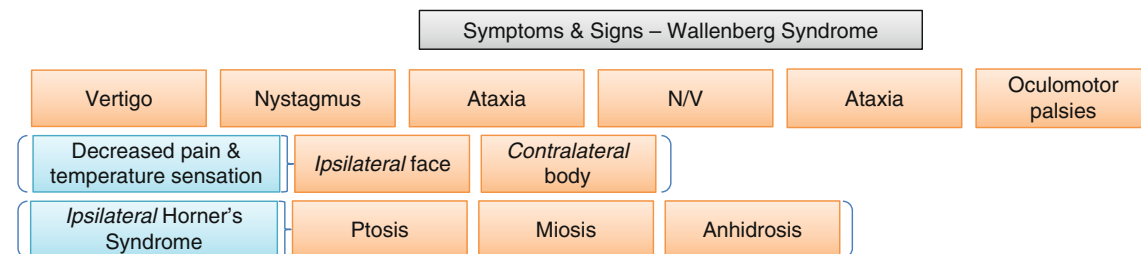
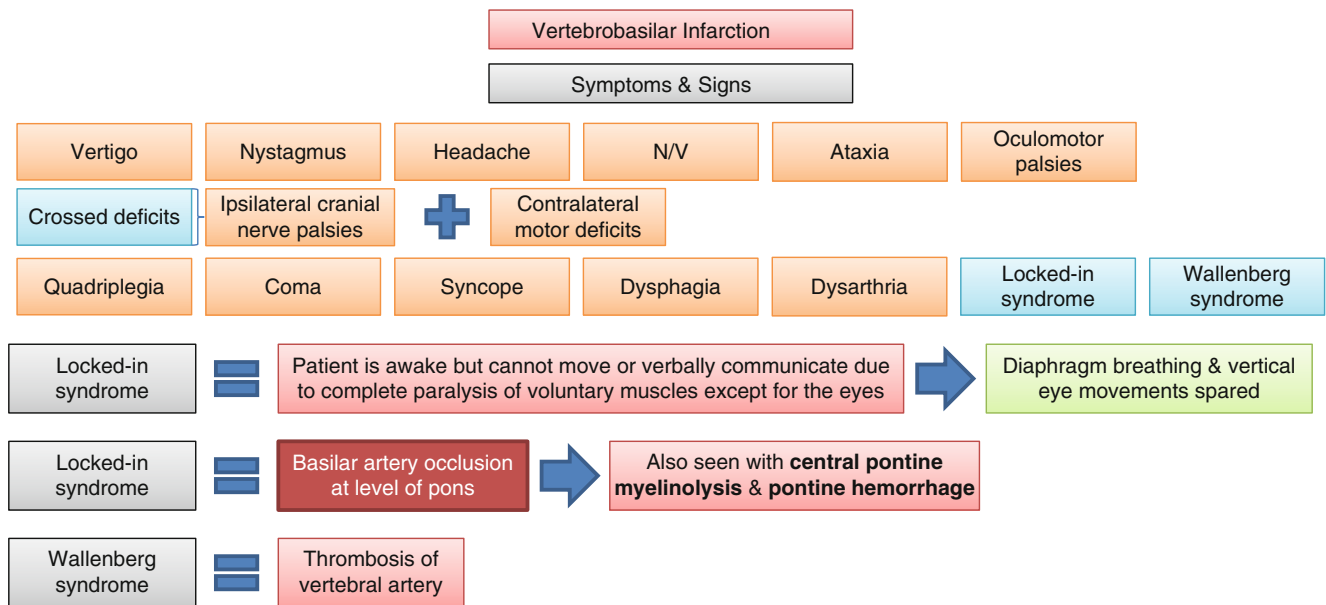
Stroke and TIA



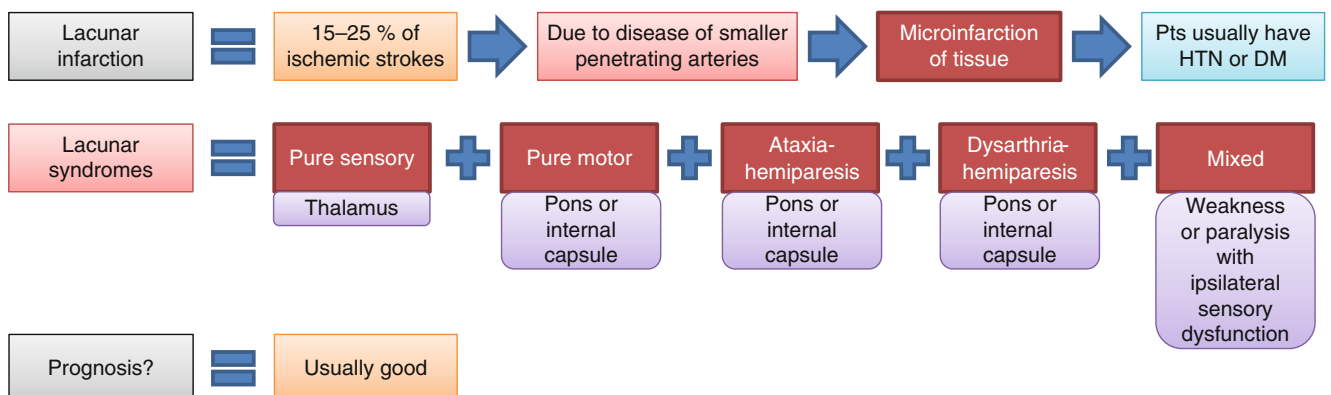
Anterior Circulation Stroke



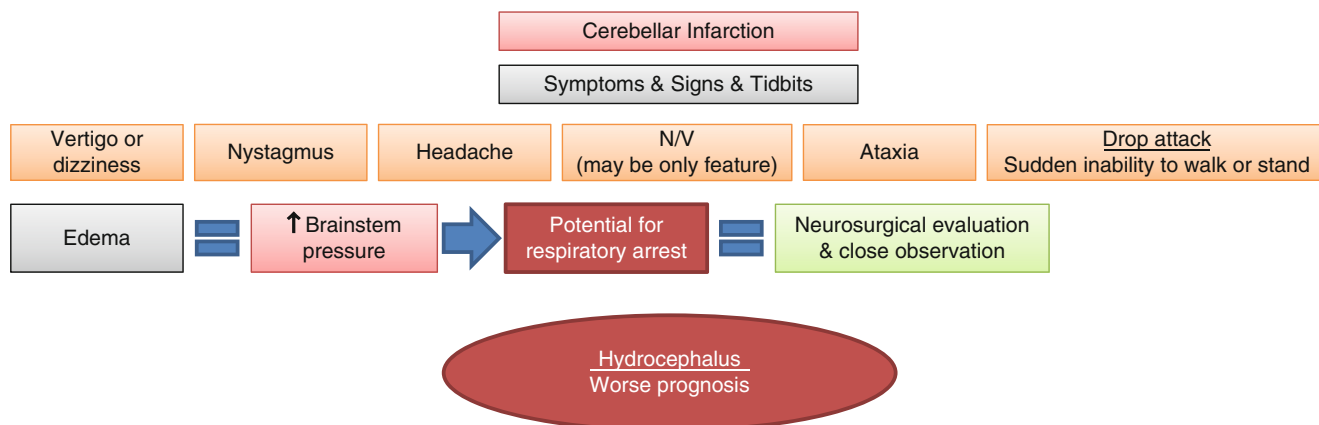
Vertebrobasilar Infarction



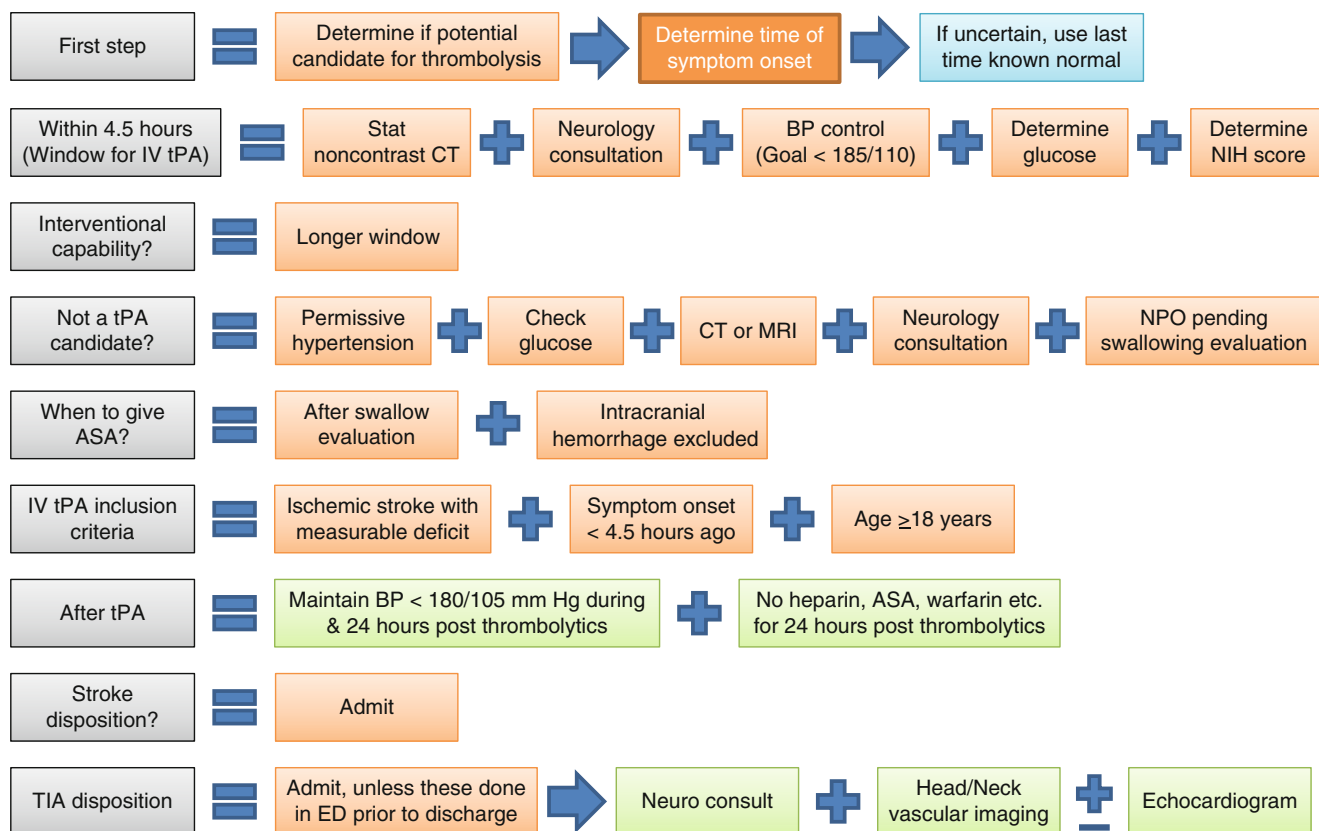
Lacunar Infarction



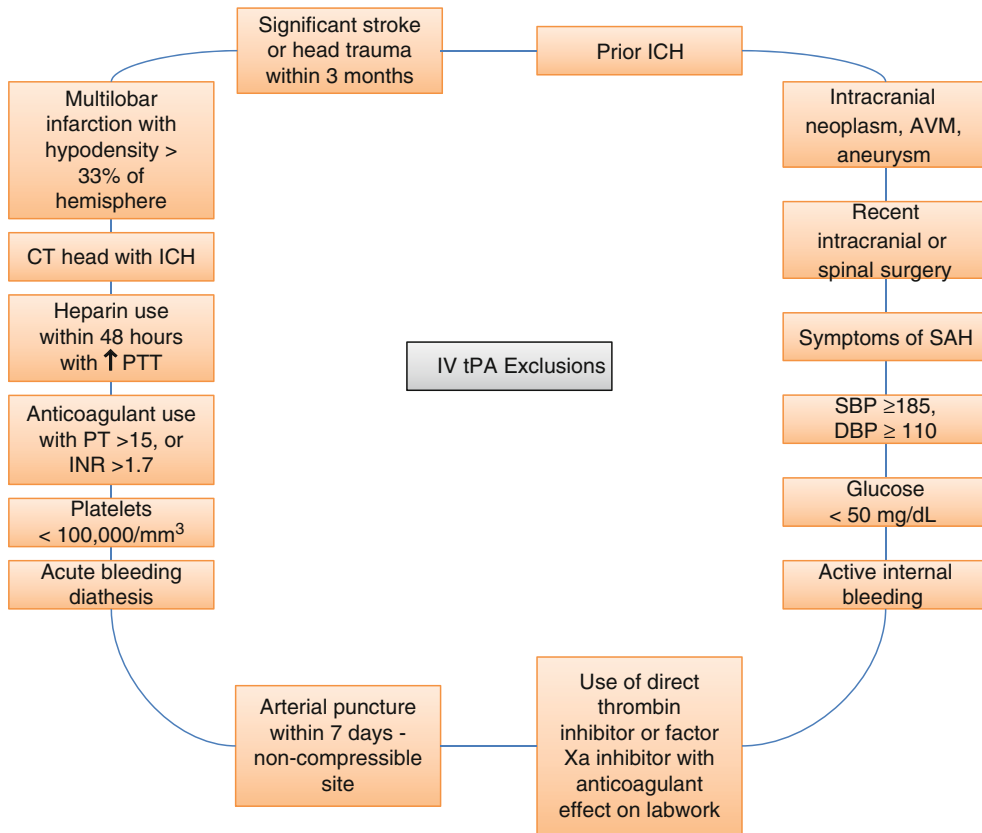
Cerebellar Infarction



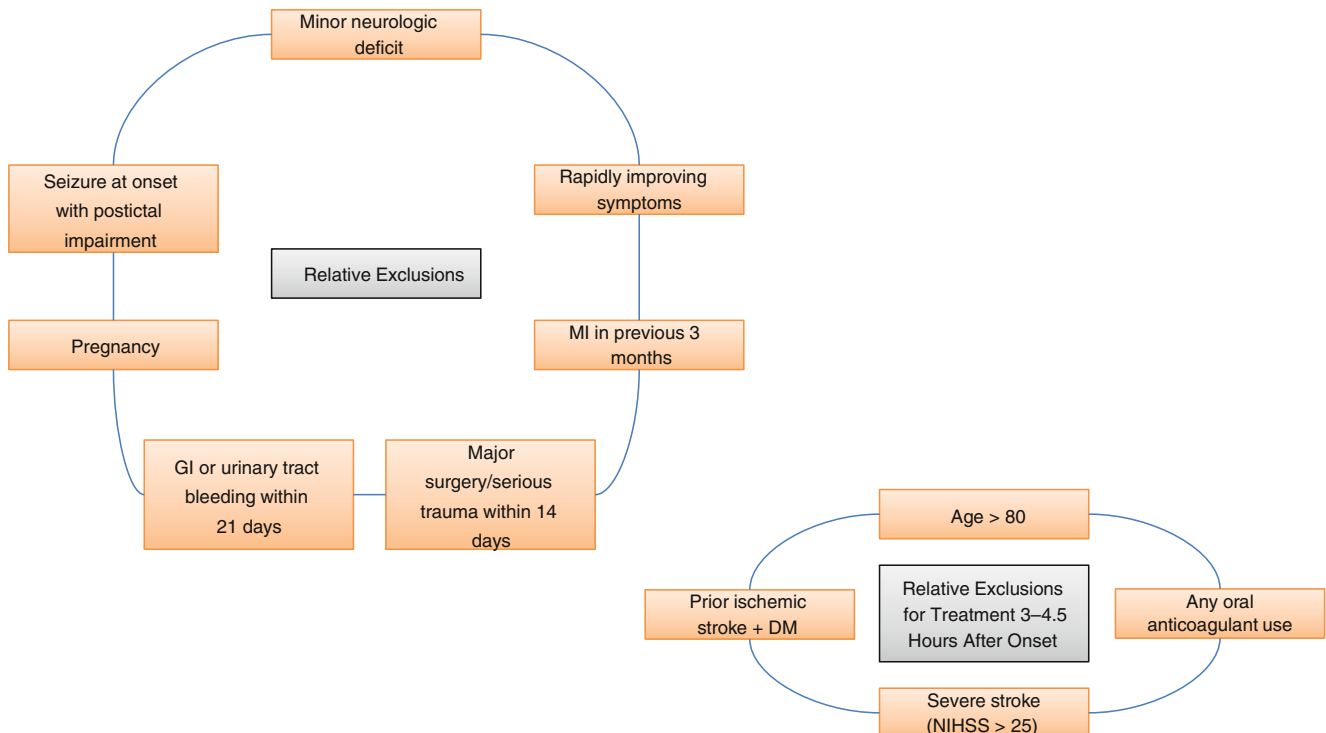
Acute Ischemic Stroke Treatment



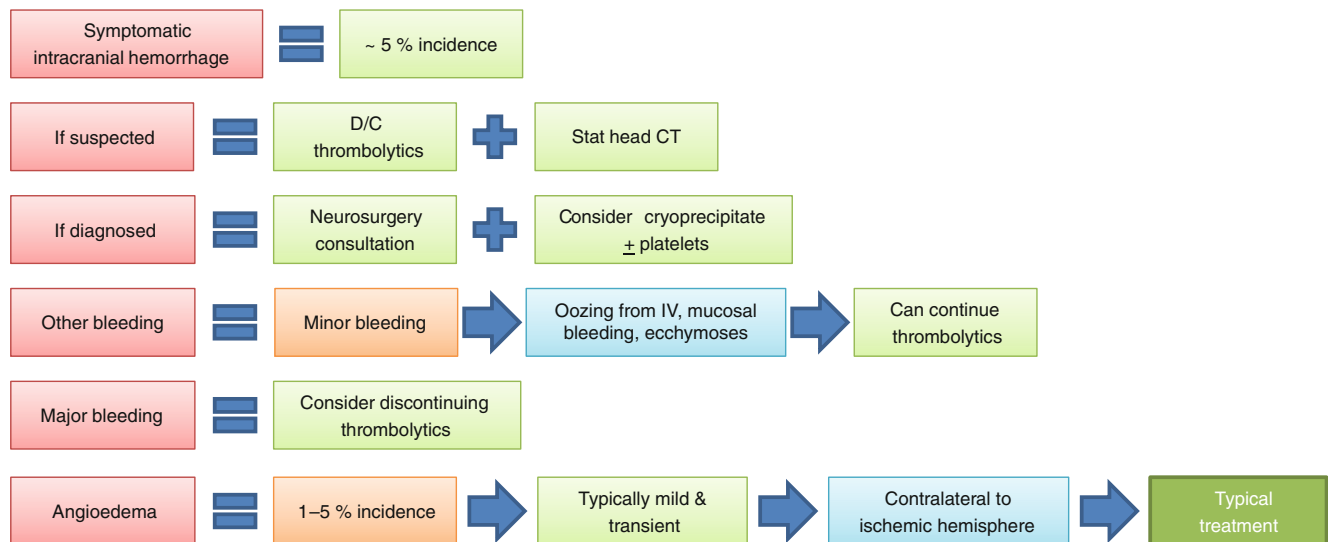
IV tPA Exclusions



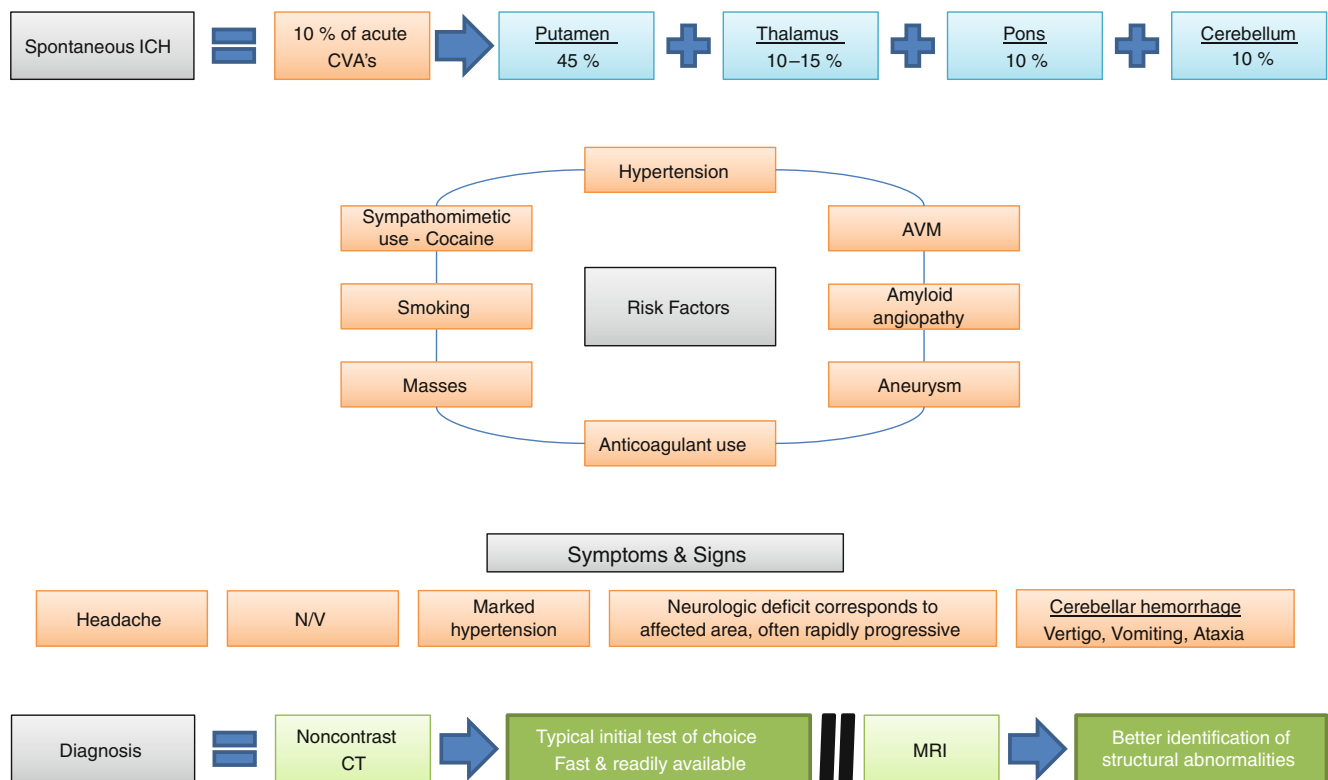
Relative Exclusions for IV tPA



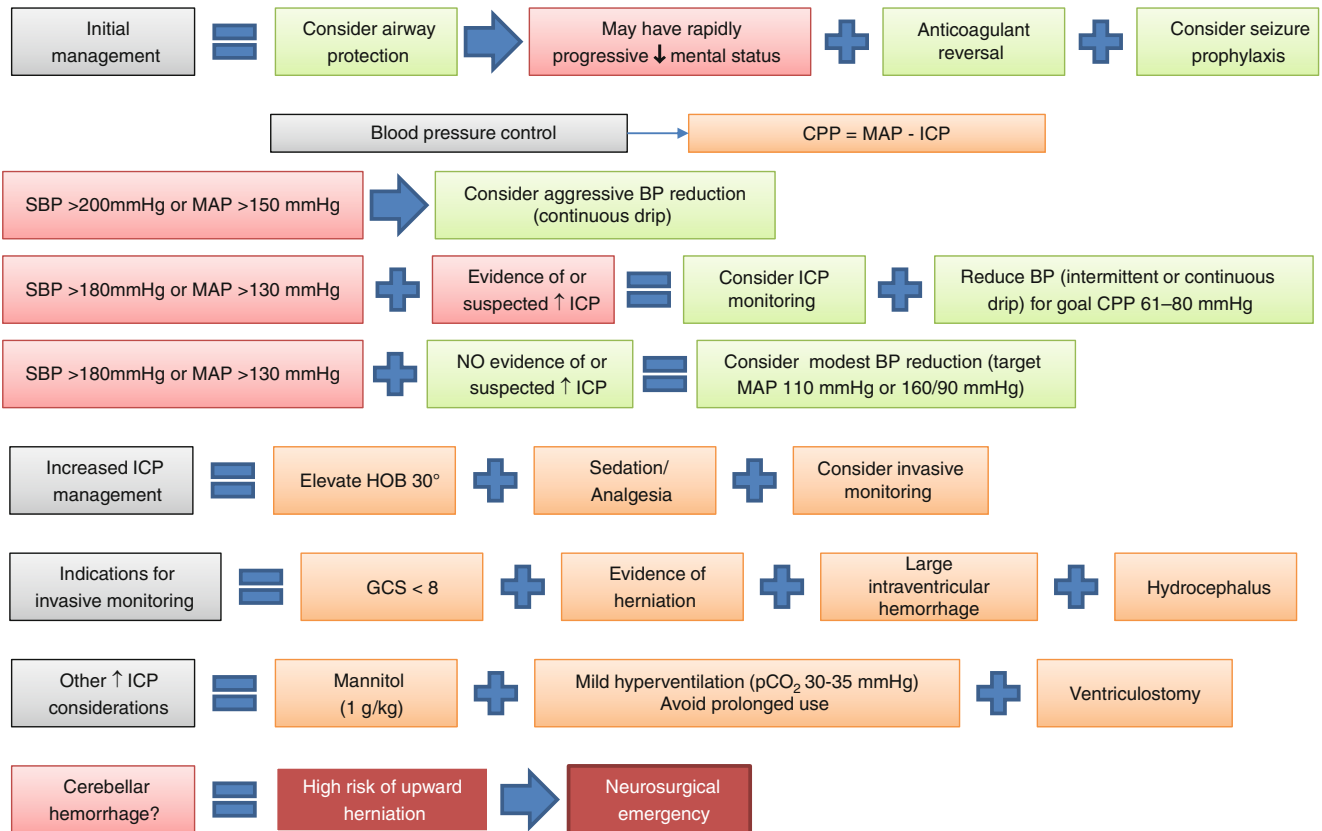
tPA Complications



Spontaneous Intracranial Hemorrhage

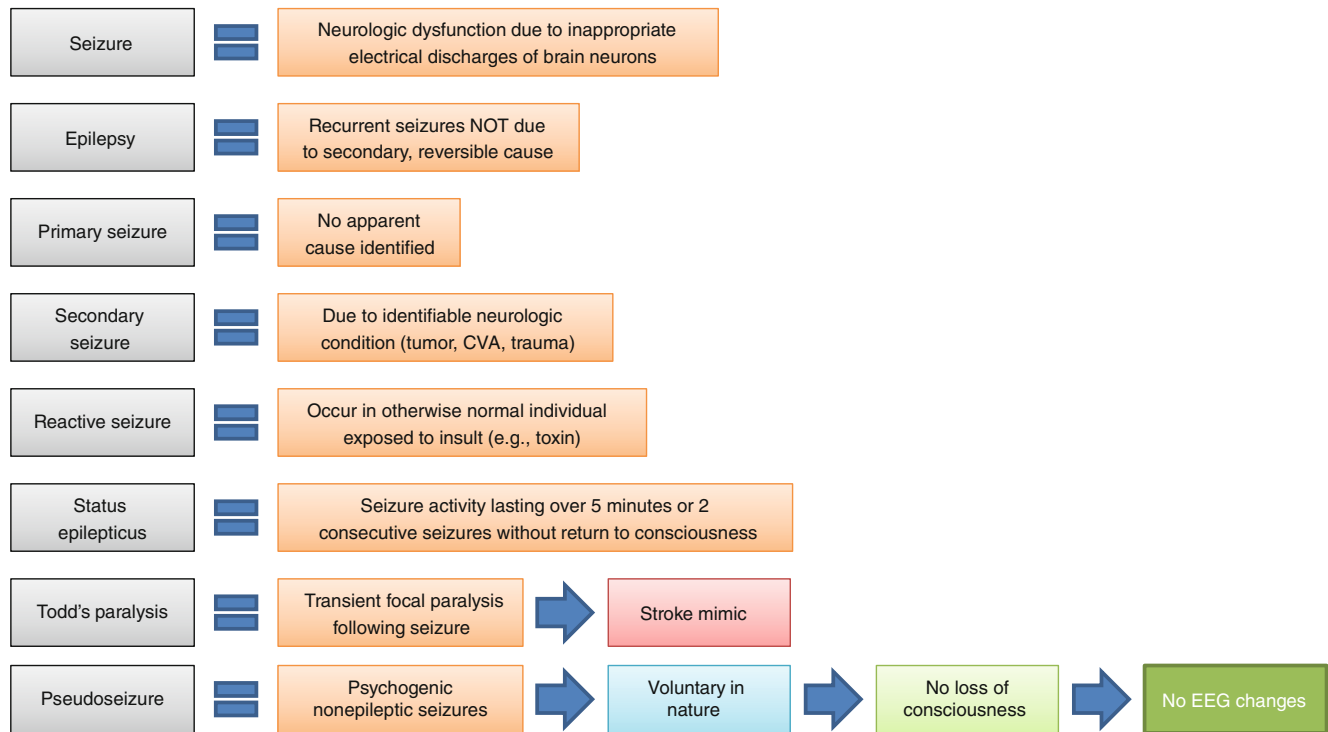


Intracranial Hemorrhage Management

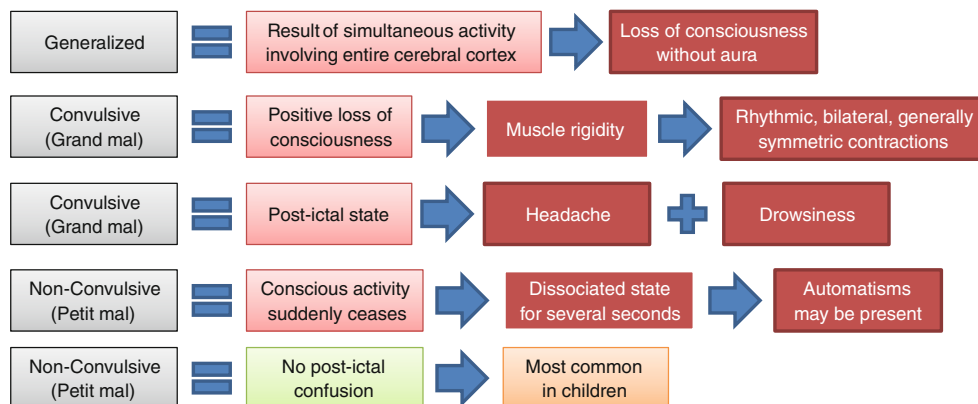


Seizures

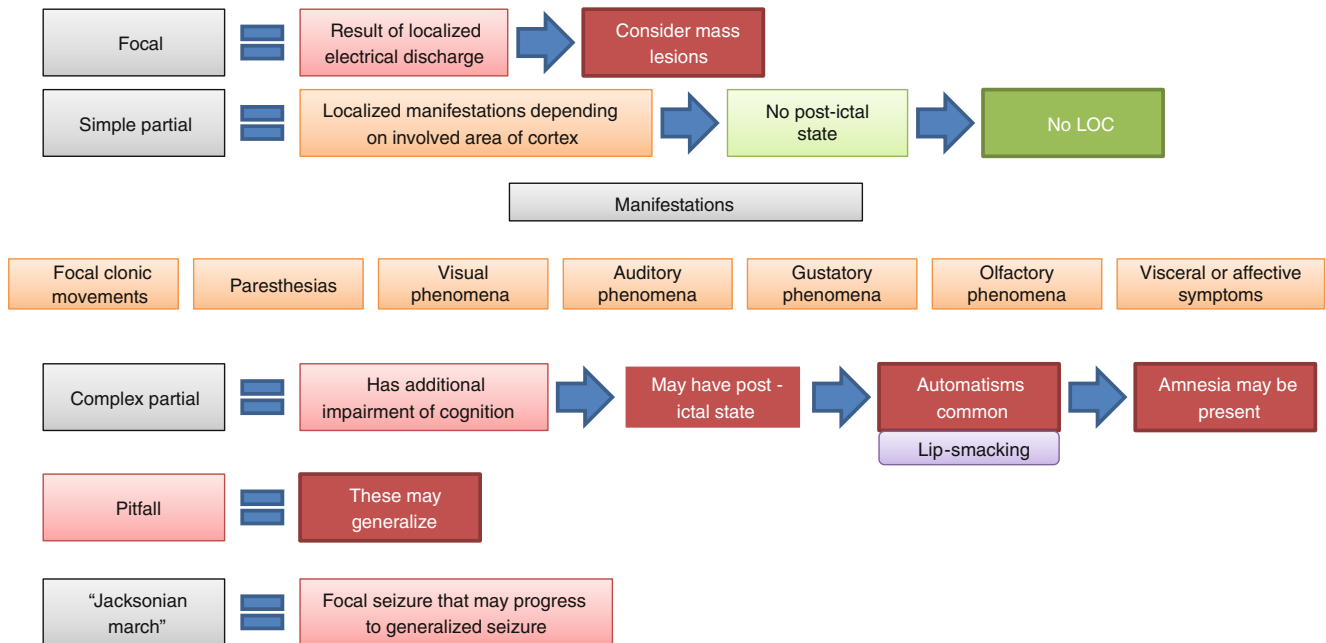
Definitions



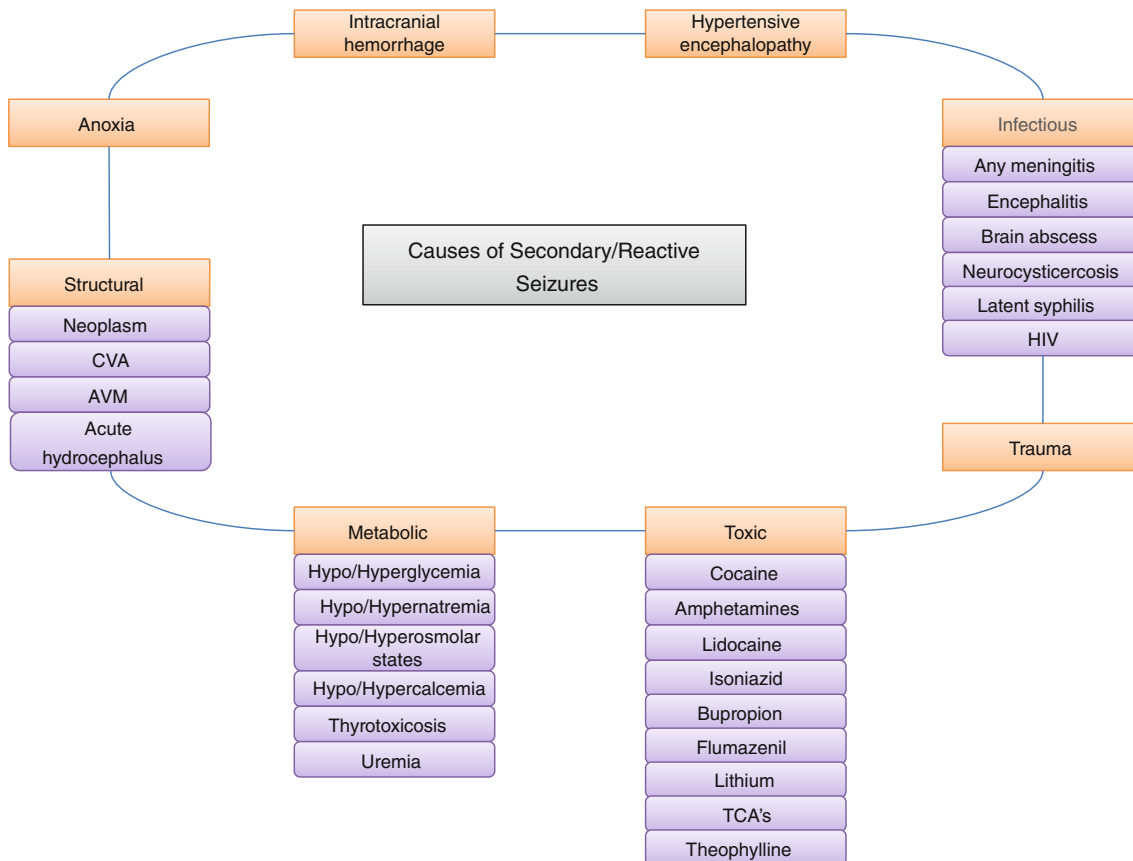
Seizure Classification: Generalized



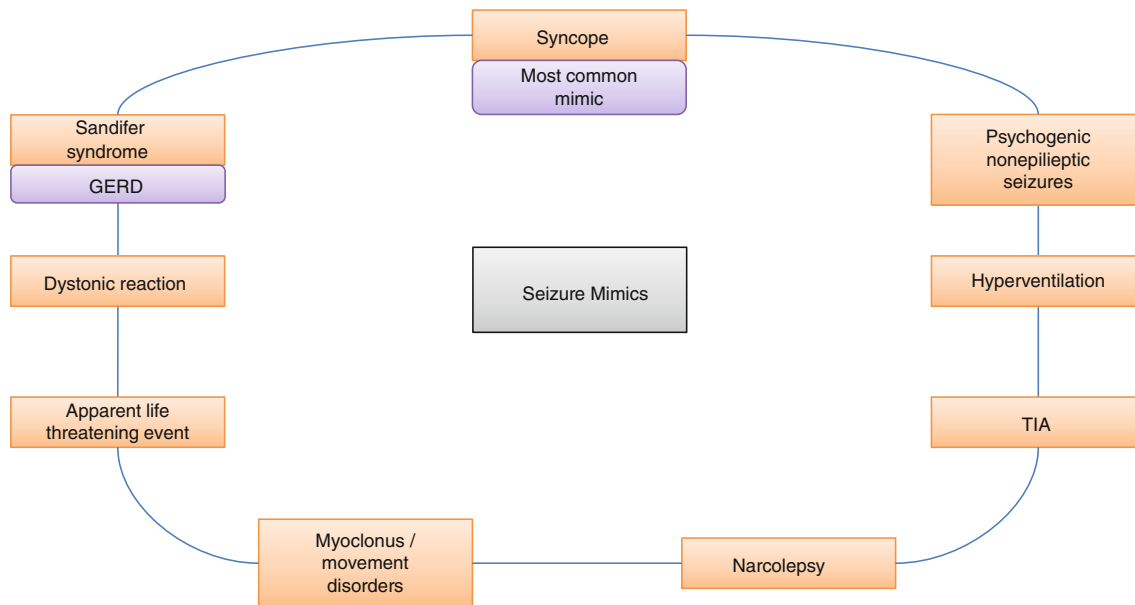
Seizure Classification: Focal



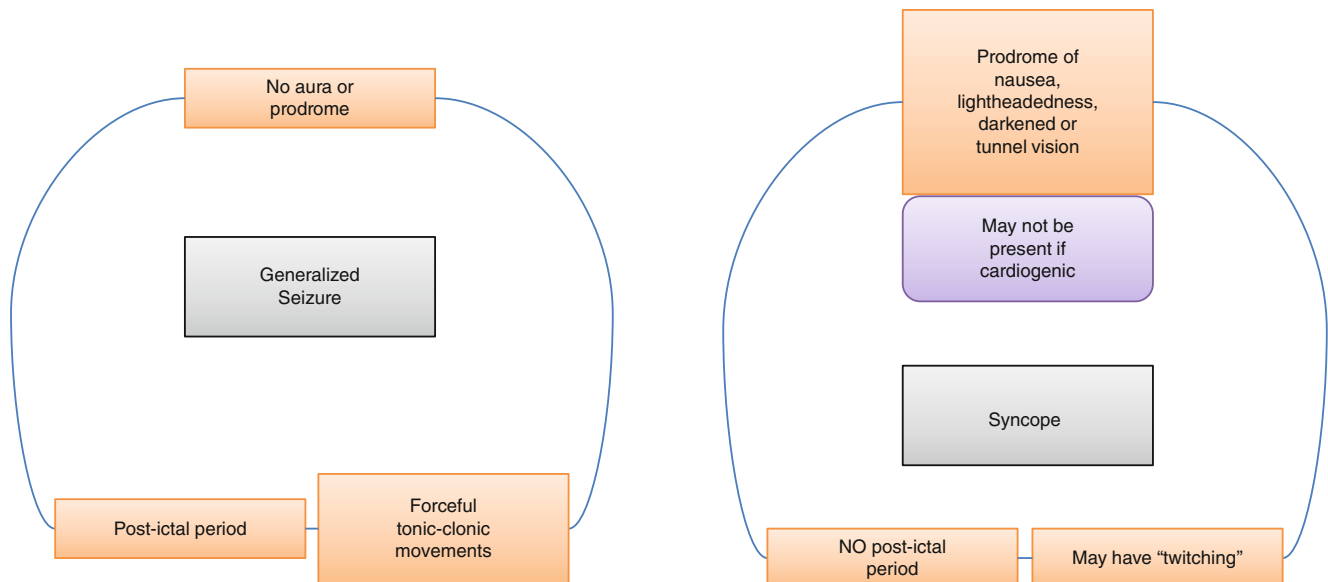
Causes of Secondary/Reactive Seizures



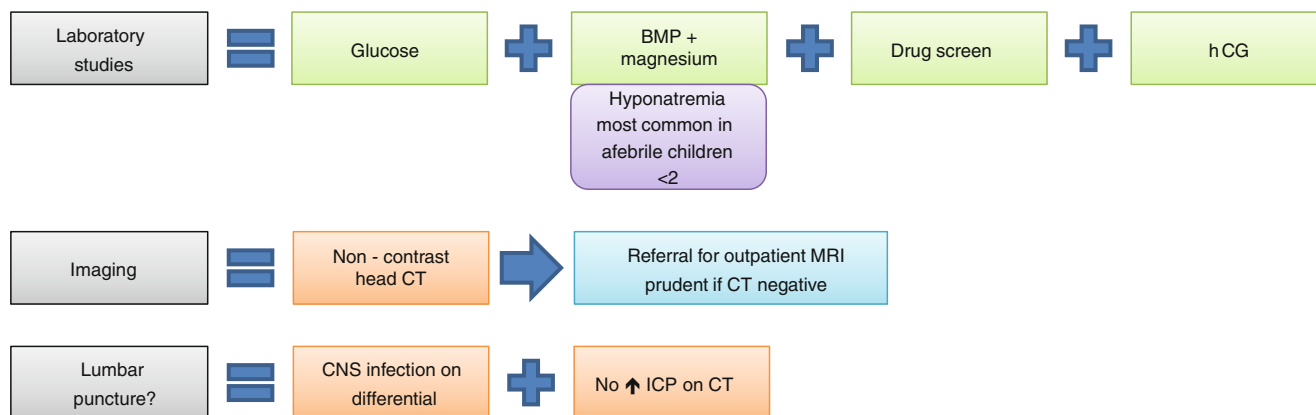
Seizure Mimics



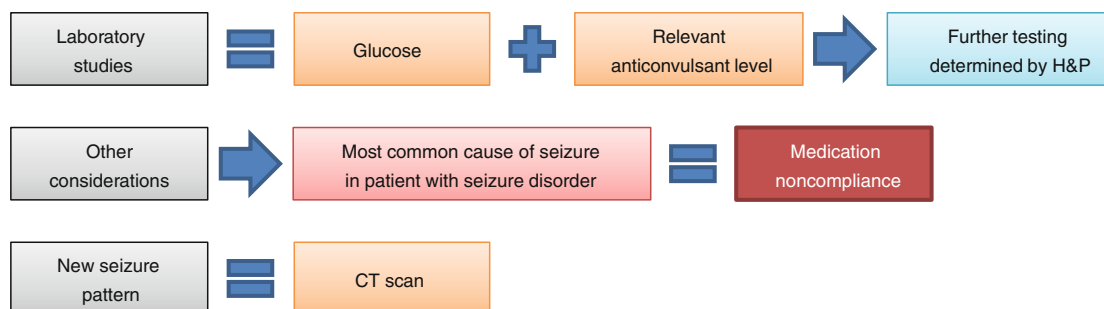
Seizure Versus Syncope



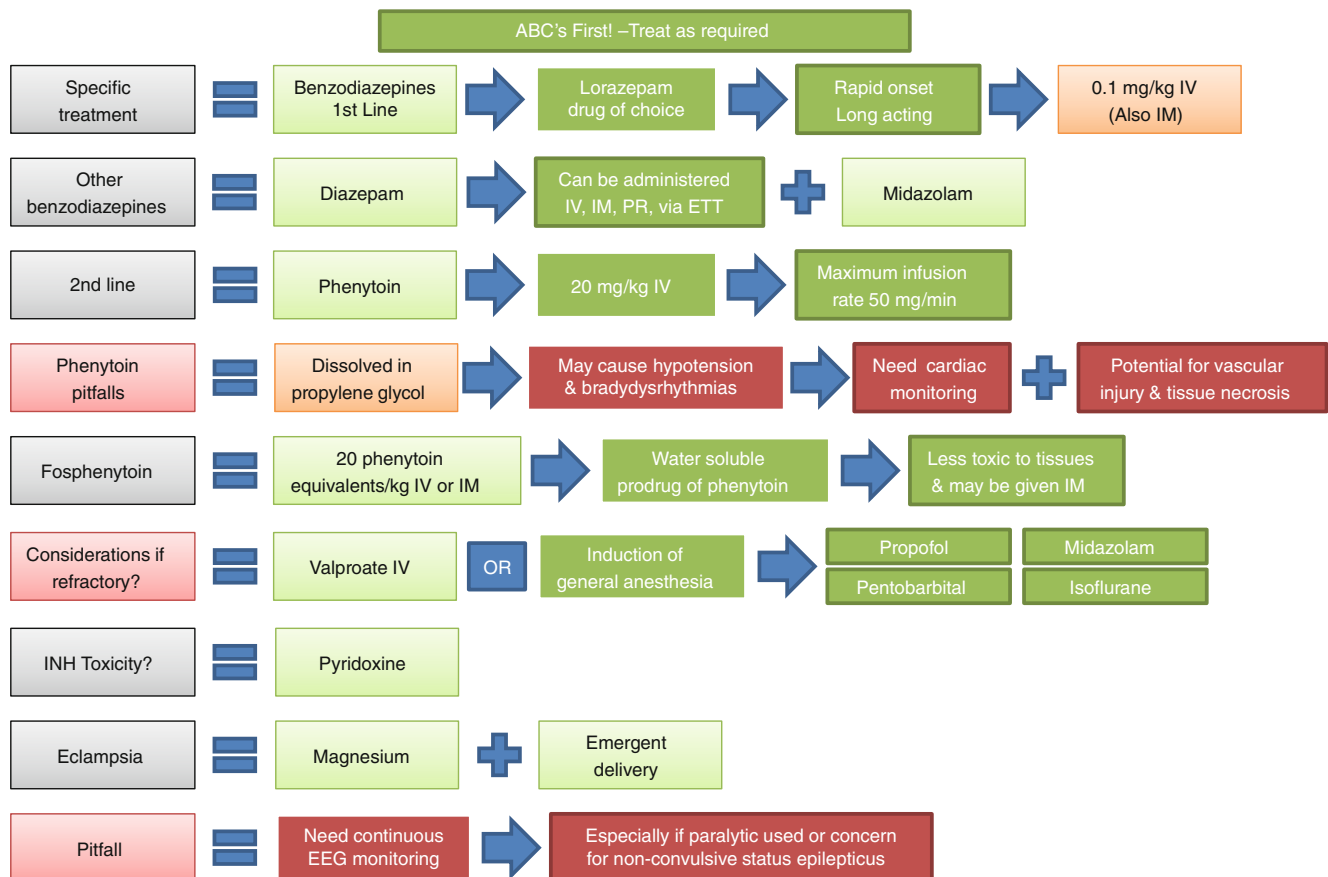
Routine First Seizure Evaluation



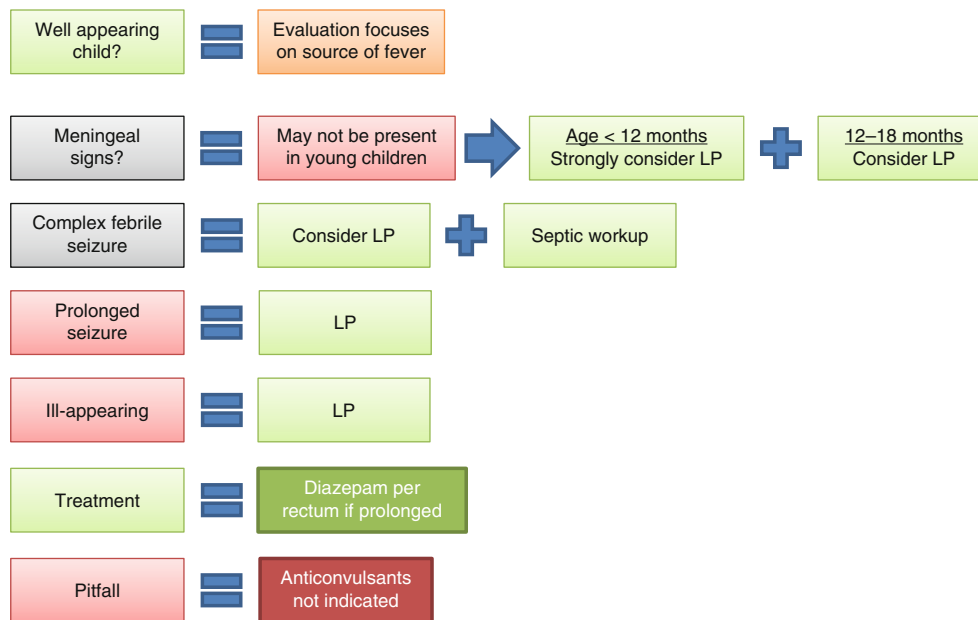
Recurrent Seizure Evaluation



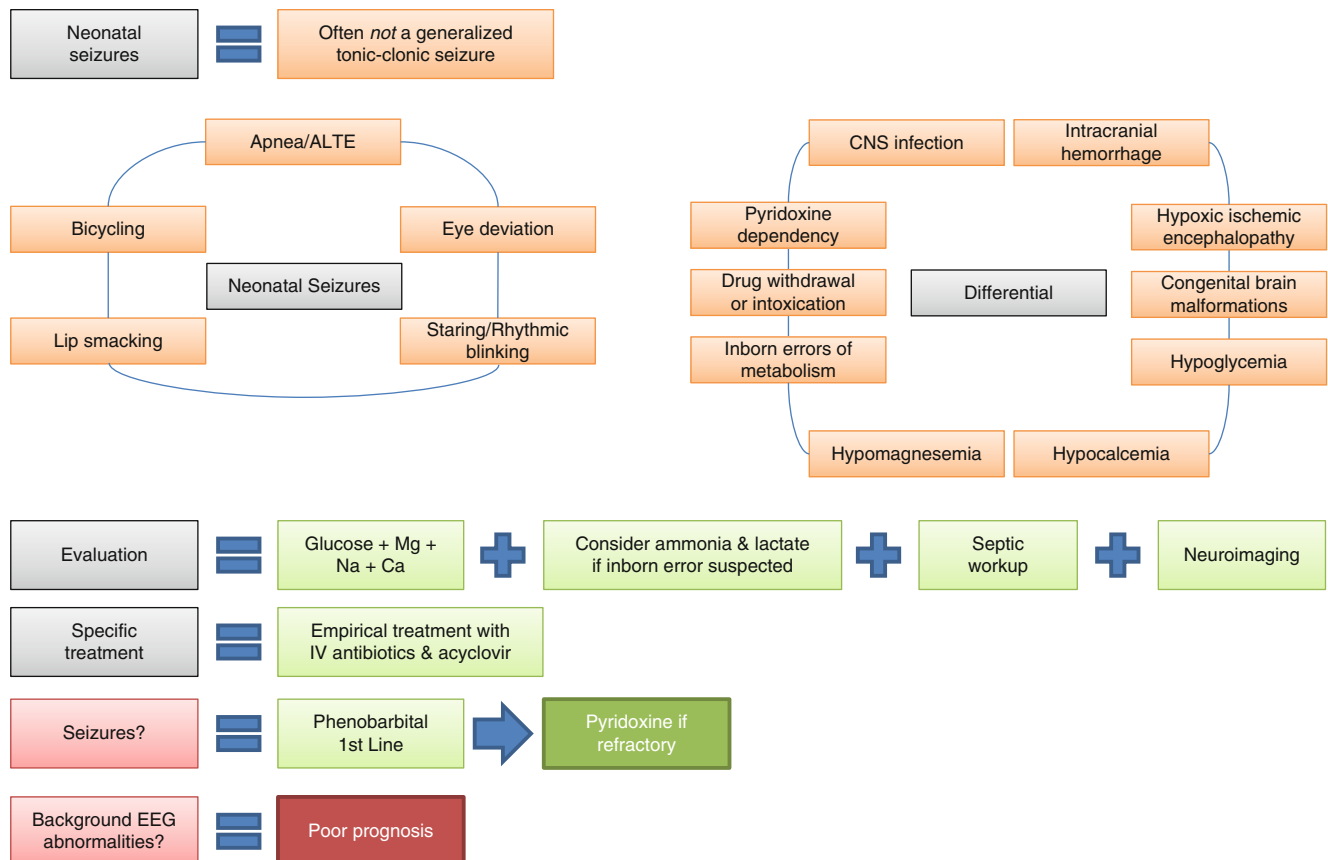
Adult Status Epilepticus Management



Febrile Seizure Evaluation and Management



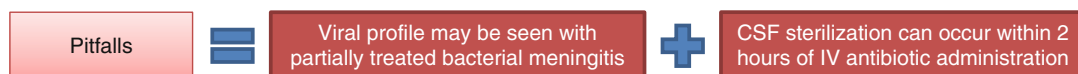
Neonatal Seizures (<28 Days)



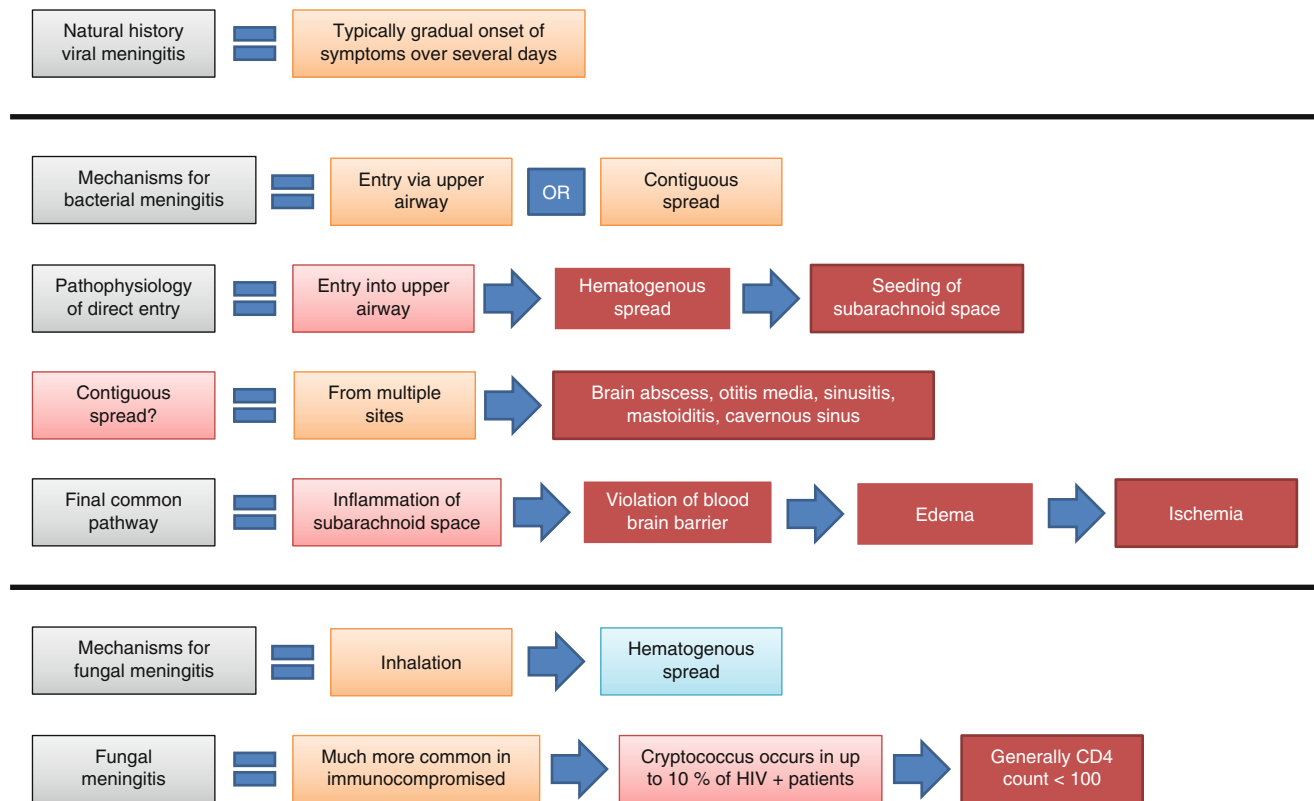
CNS Infections

Typical CSF Characteristics

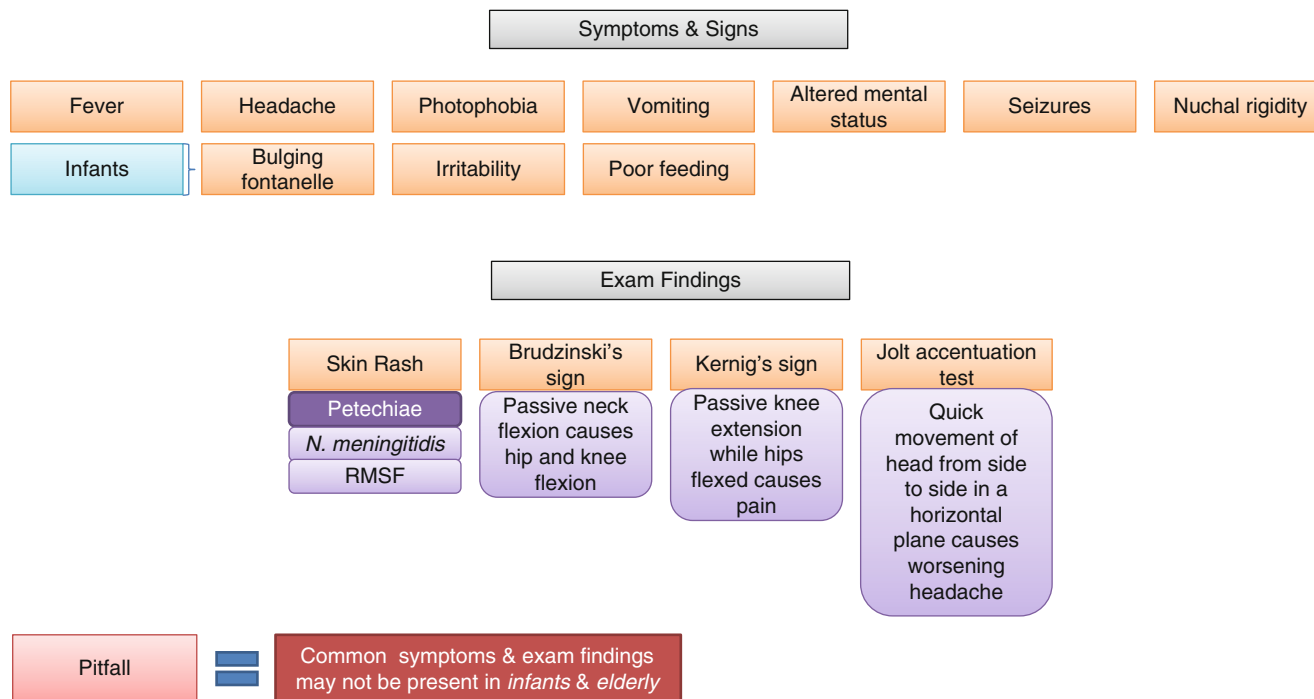
	Normal	Bacterial	Viral	Fungal	TB	Abscess	Preterm Term Child Normals
WBCs	< 5	> 1000	< 1000	100-500	100-500	10-1000	0-25 7.3 ± 13.9 0-7
% PMNs	0-15	> 80	< 50	< 50	< 50	< 50	57 61-84 5
% Lymph	> 50	< 50	> 50	> 80	Inc. Mono	Varies	
Protein (mg/dL)	20-45	> 150	50-100	100-500	100-500	> 50	65-120 64.2 ± 24.2 5-40
Glucose (mg/dL)	40-65	< 40	40-65	30-45	30-45	45-60	24-63 51.2 ± 12.9 40-80
Opening pressure (cm H ₂ O)	6-20	> 25-30	Variable	> 20	> 20	Variable	8-11 < 20 < 20



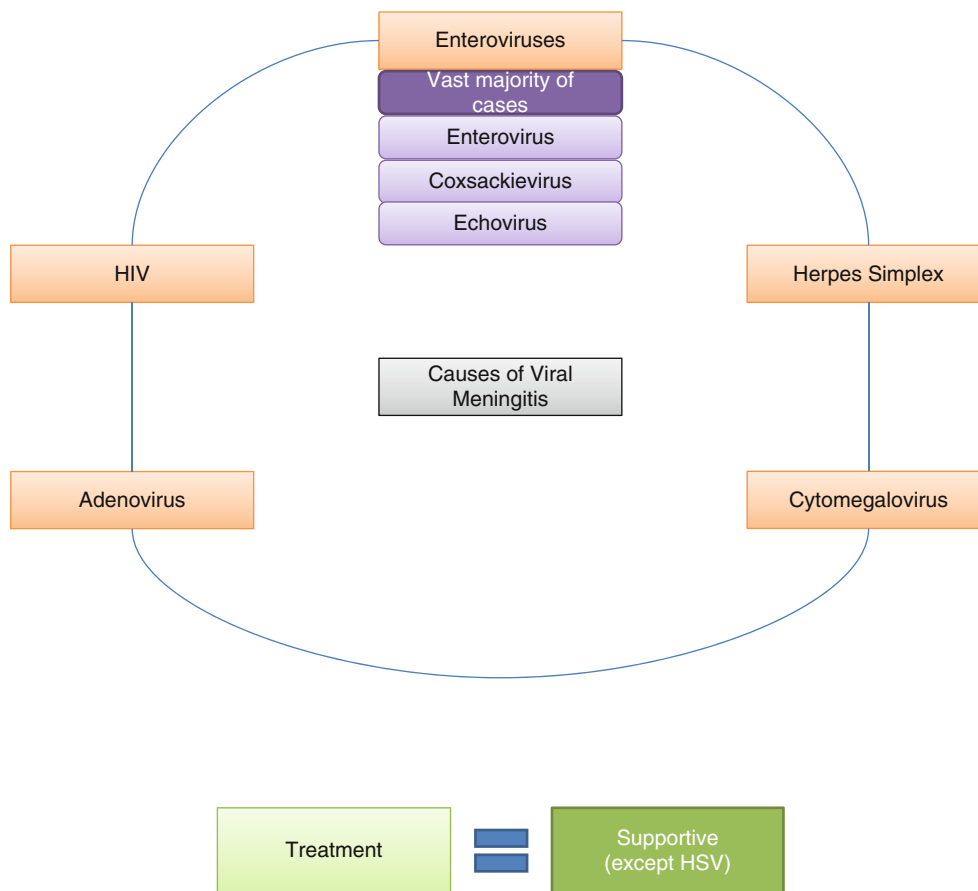
Meningitis Introduction

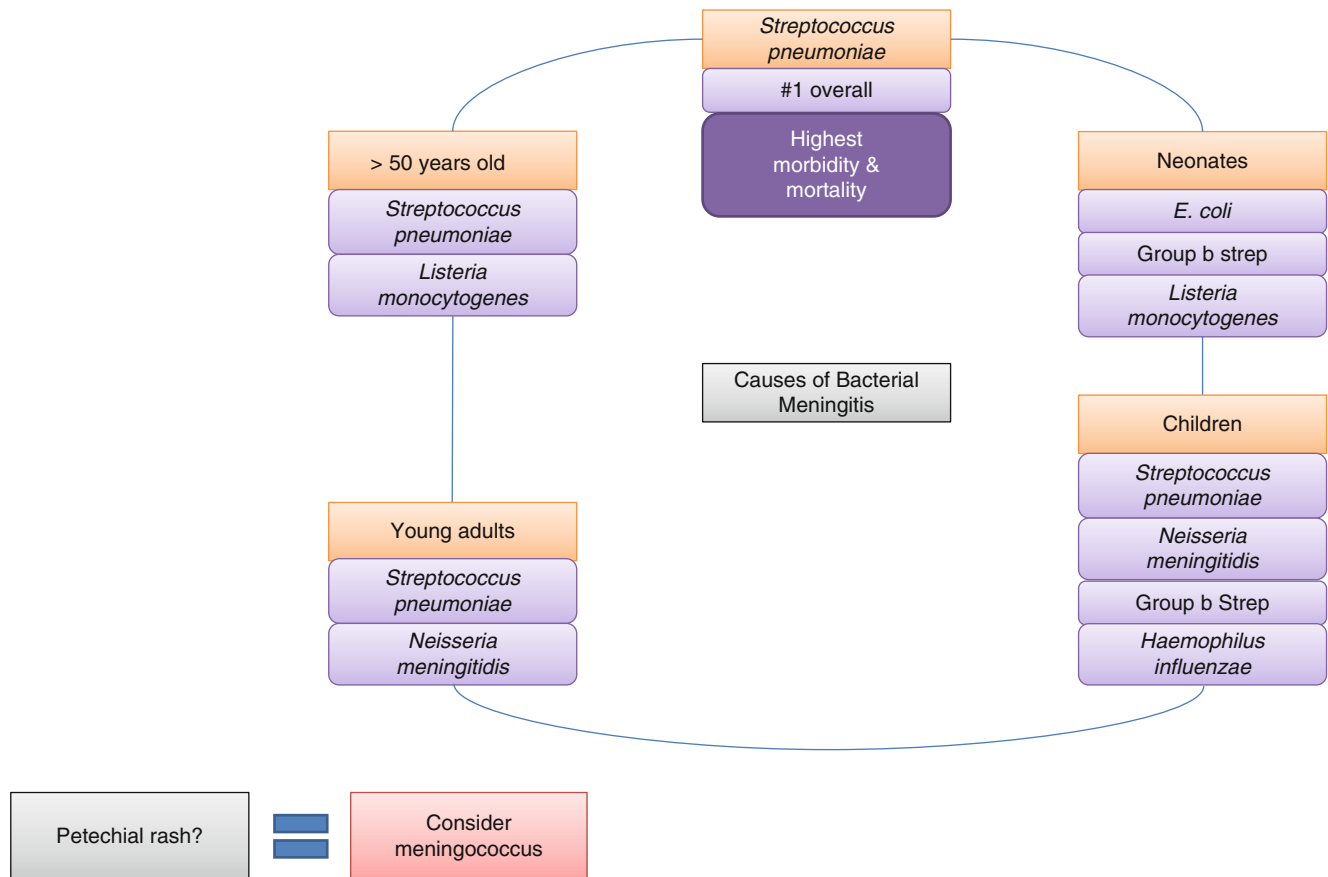


Meningitis

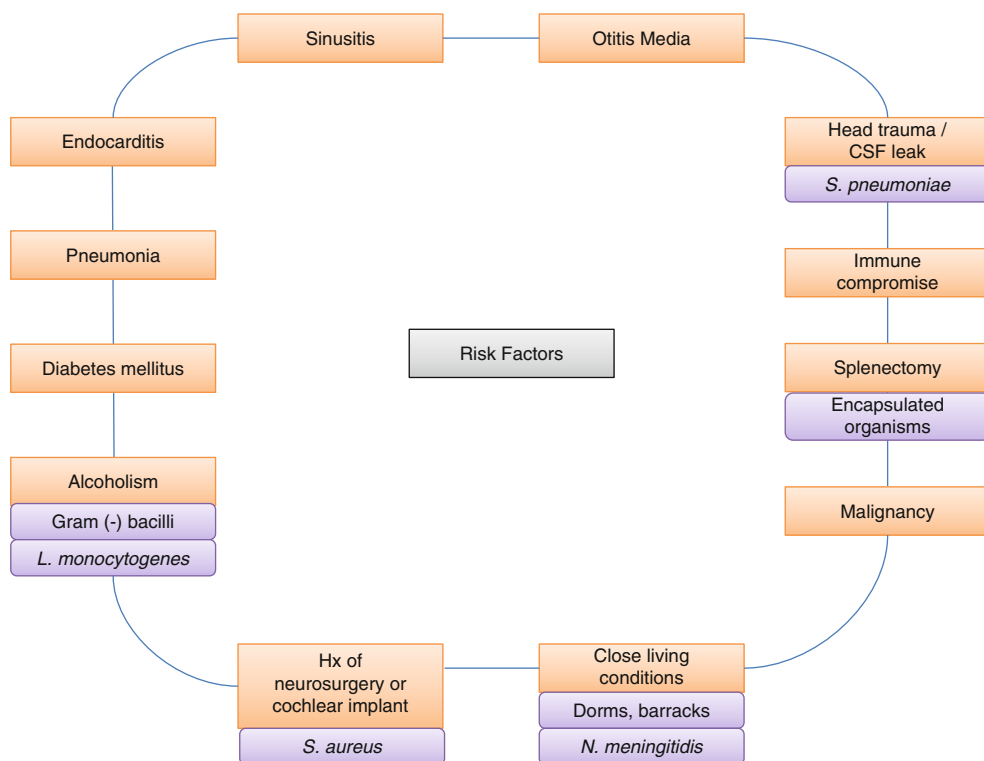


Causes of Viral Meningitis

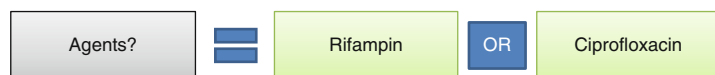
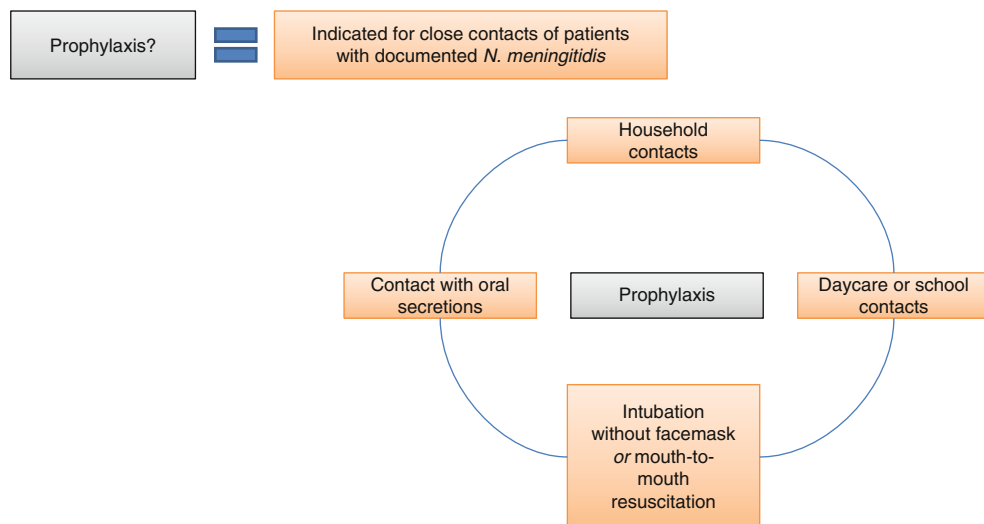


Causes of Bacterial Meningitis

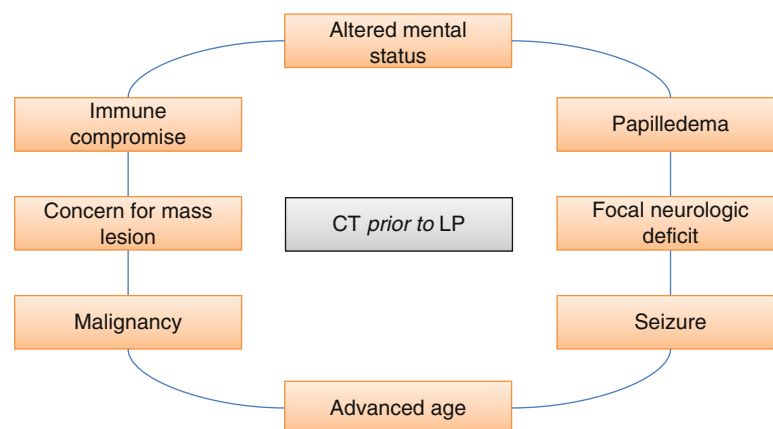
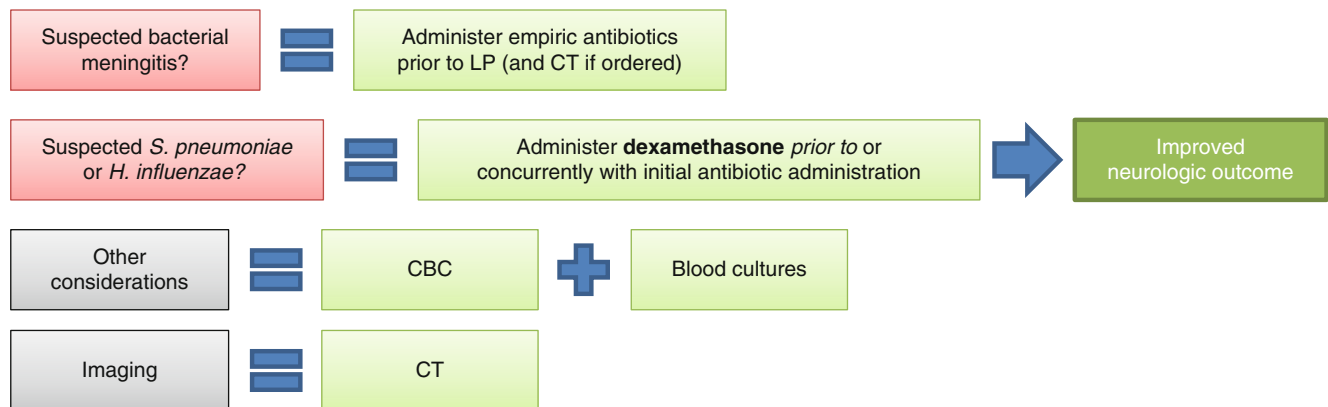
Risk Factors



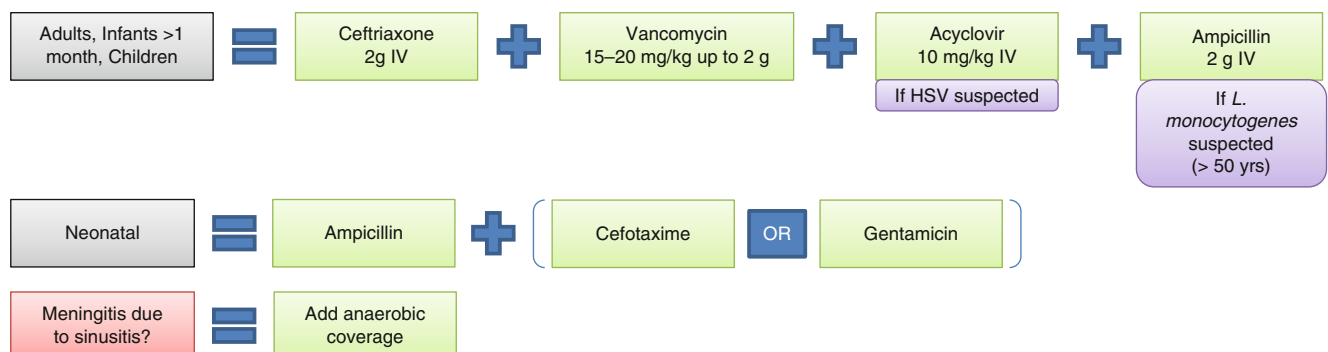
Meningitis Prophylaxis



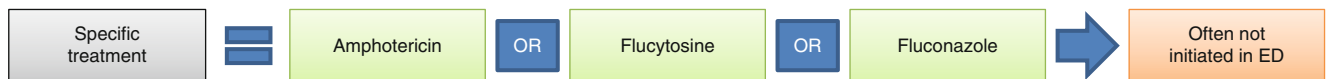
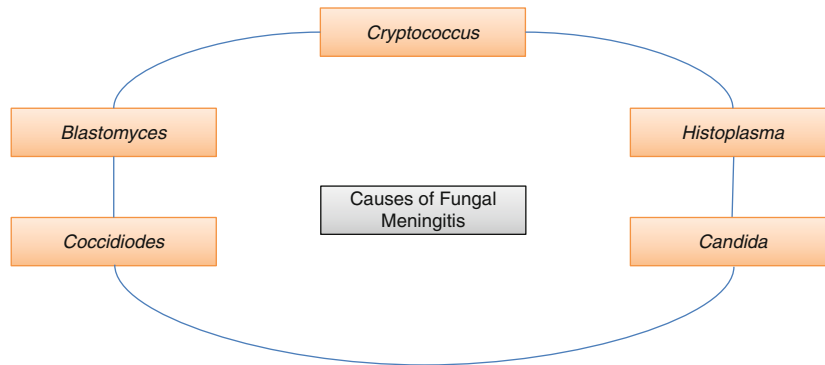
Evaluation



Empiric Antibiotic Treatment



Fungal Meningitis

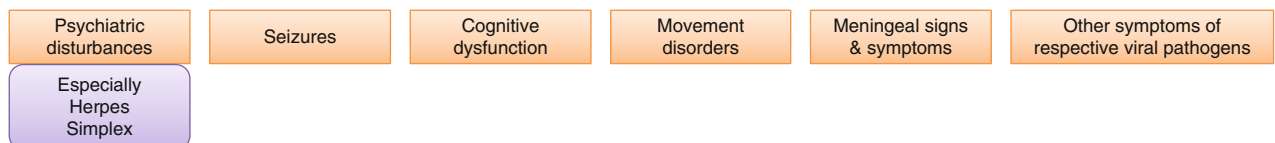


Encephalitis

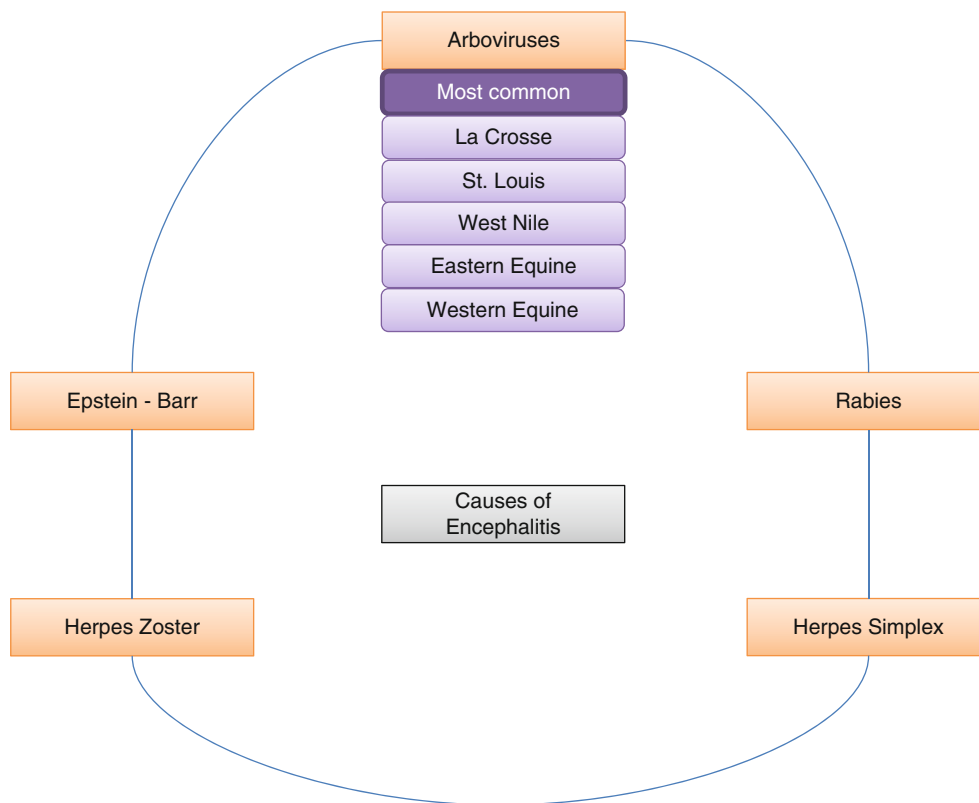
Encephalitis: Introduction



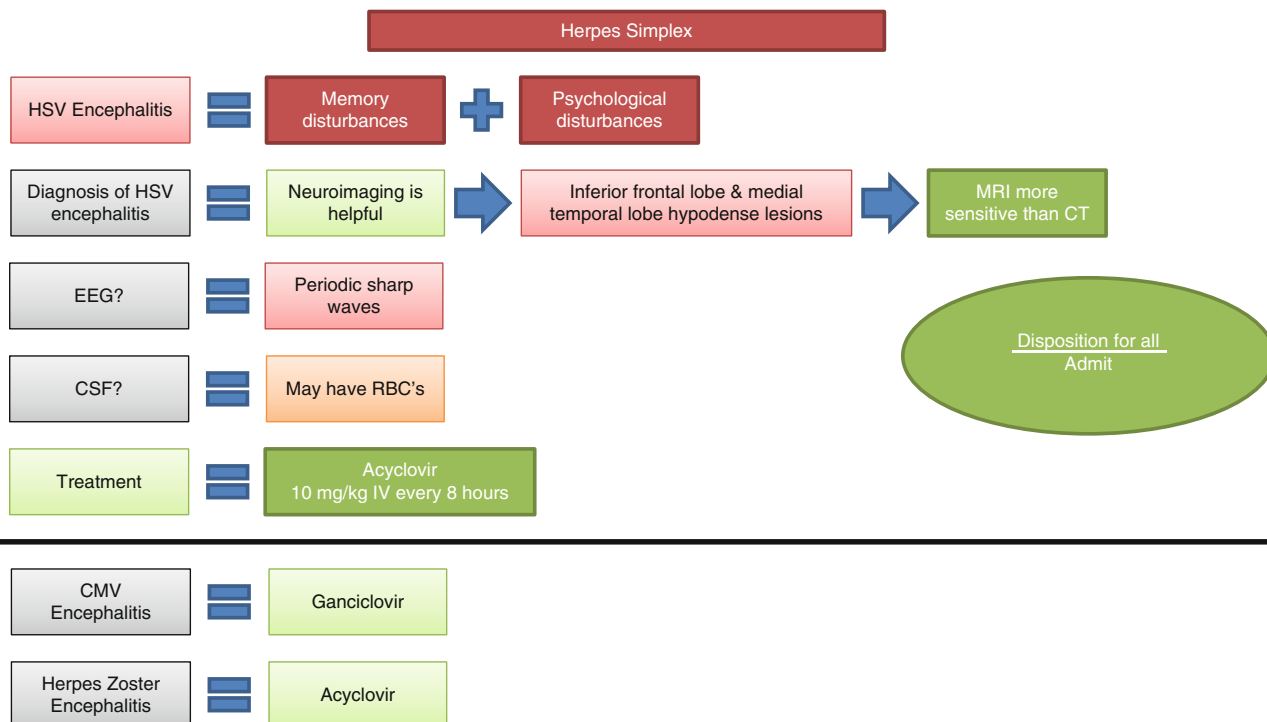
Symptoms & Signs



Encephalitis Causes

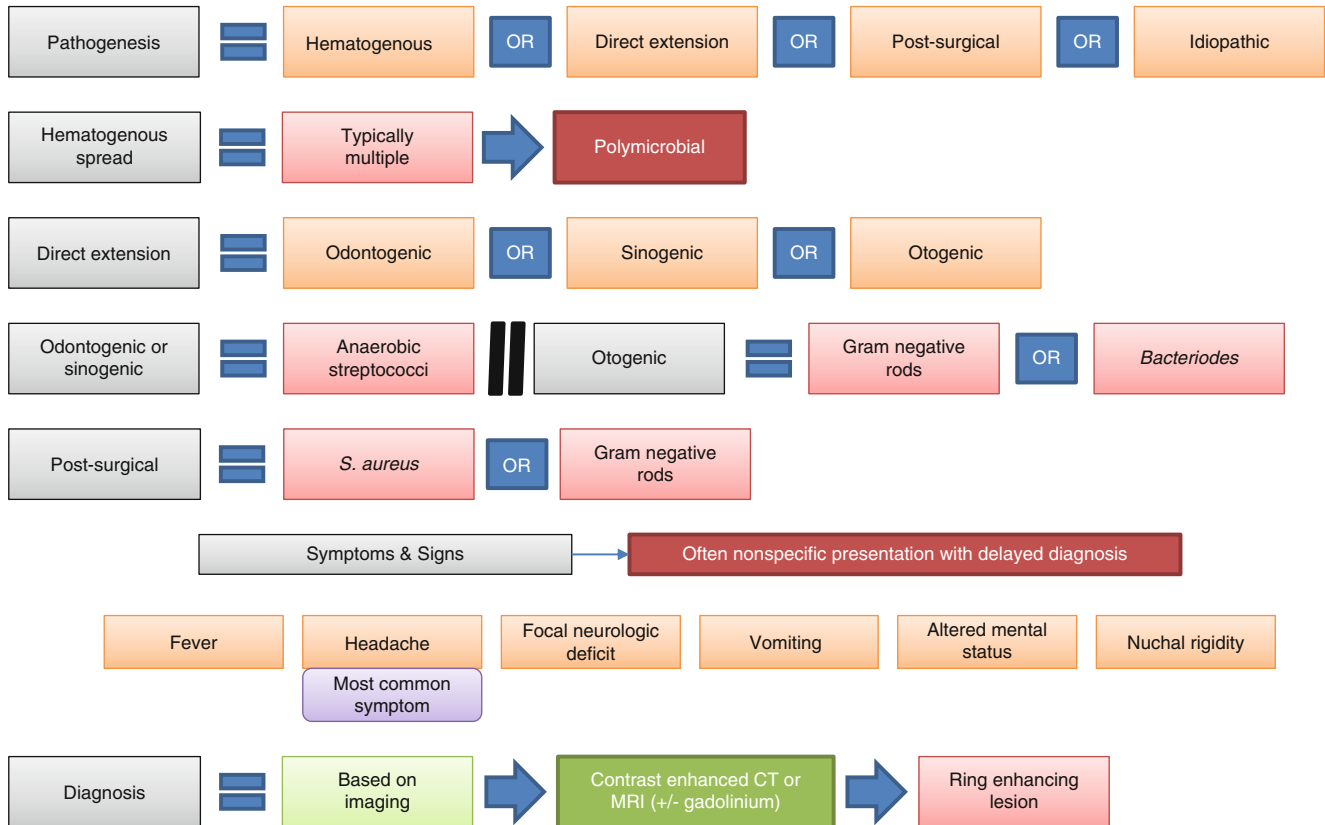


Encephalitis Diagnosis and Management

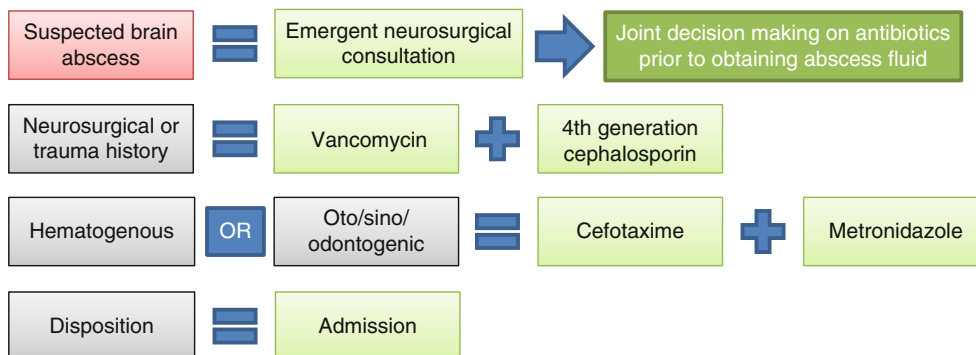


Brain Abscess

Brain Abscess Introduction



Management

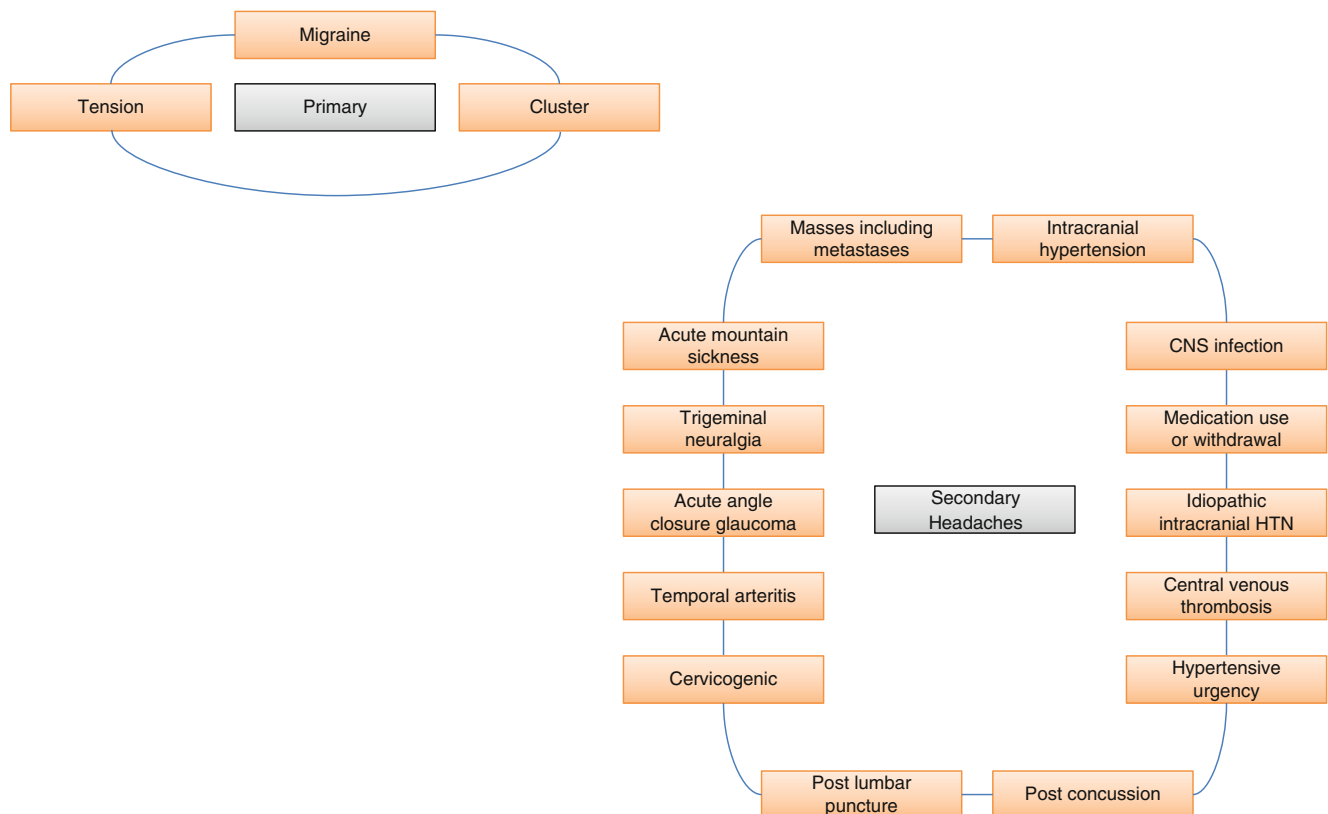


Headache Syndromes

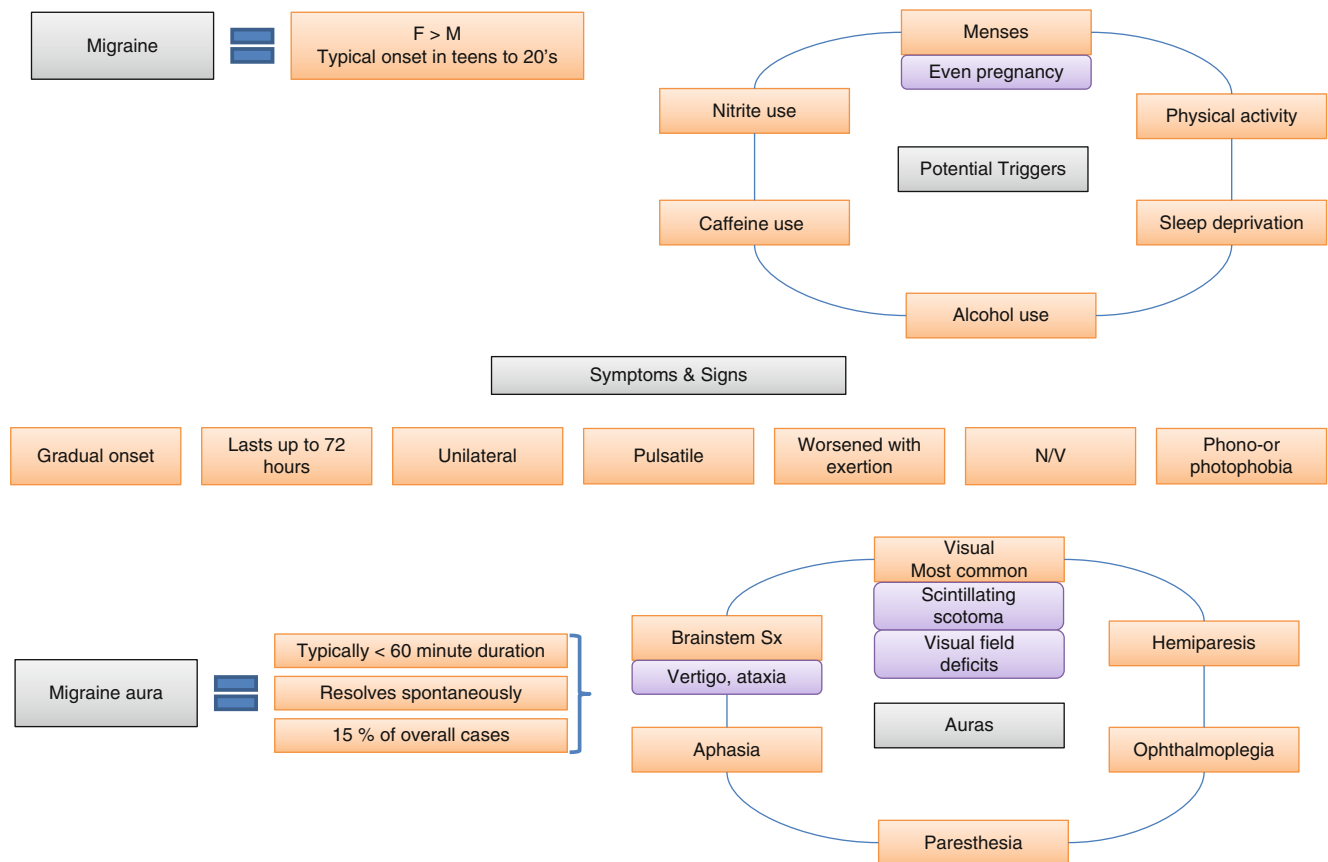
Headache Red Flags: "SNOOP"

Odor	Agent
Systemic symptoms	Fever, weight loss
Secondary risk factors	Cancer, HIV
Neurologic symptoms	Altered mental status, focal deficits
Onset	Sudden or abrupt onset
Older	New onset headache > 50 years old
Previous history	First headache or change in headache frequency, severity or features
Eyes	Diplopia, papilledema, red eye, halos around light

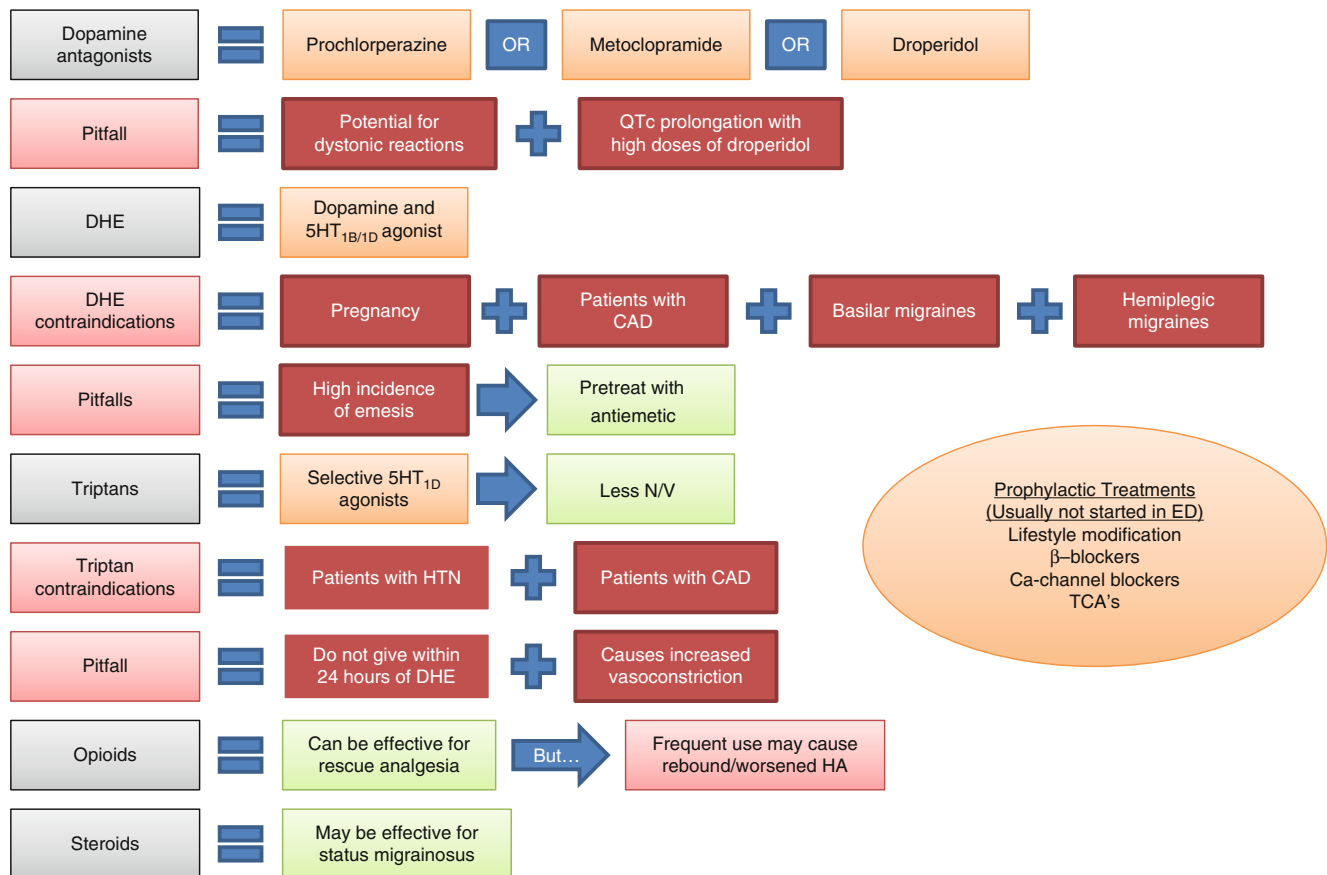
Headache Classification



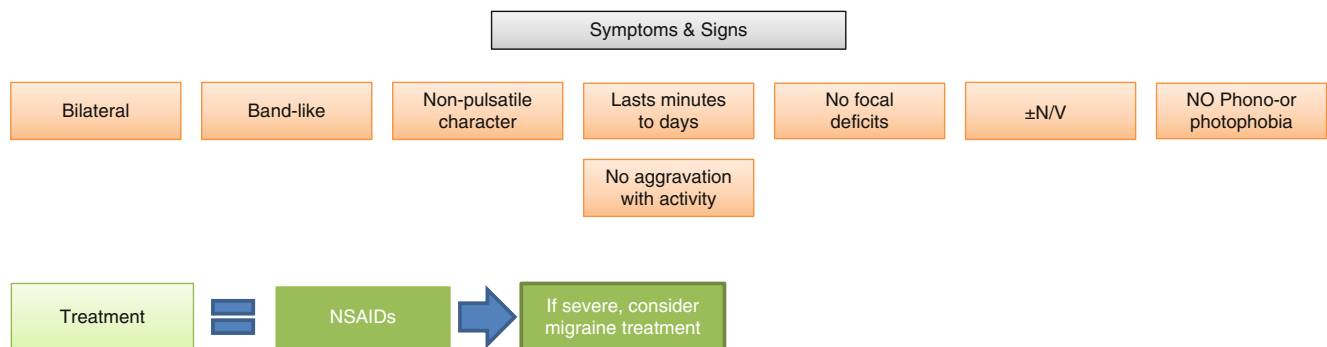
Migraine Introduction



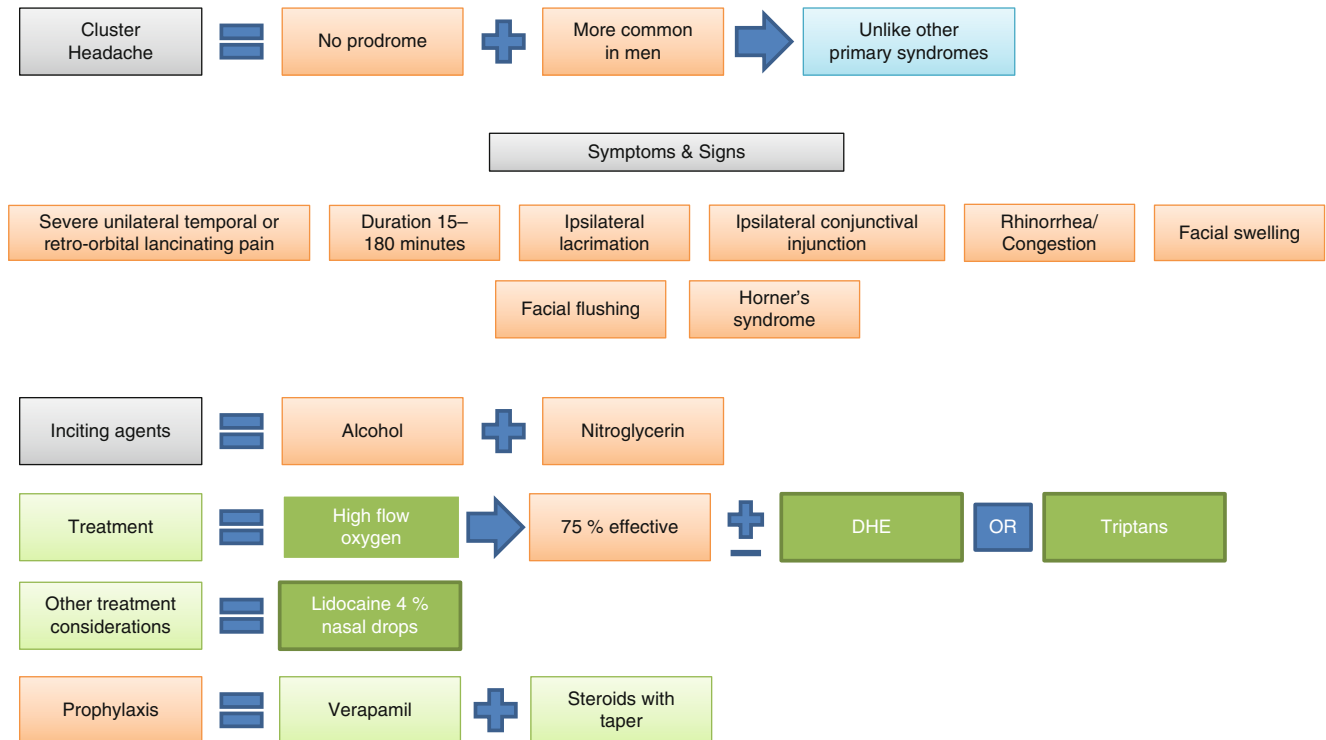
Migraine Treatment



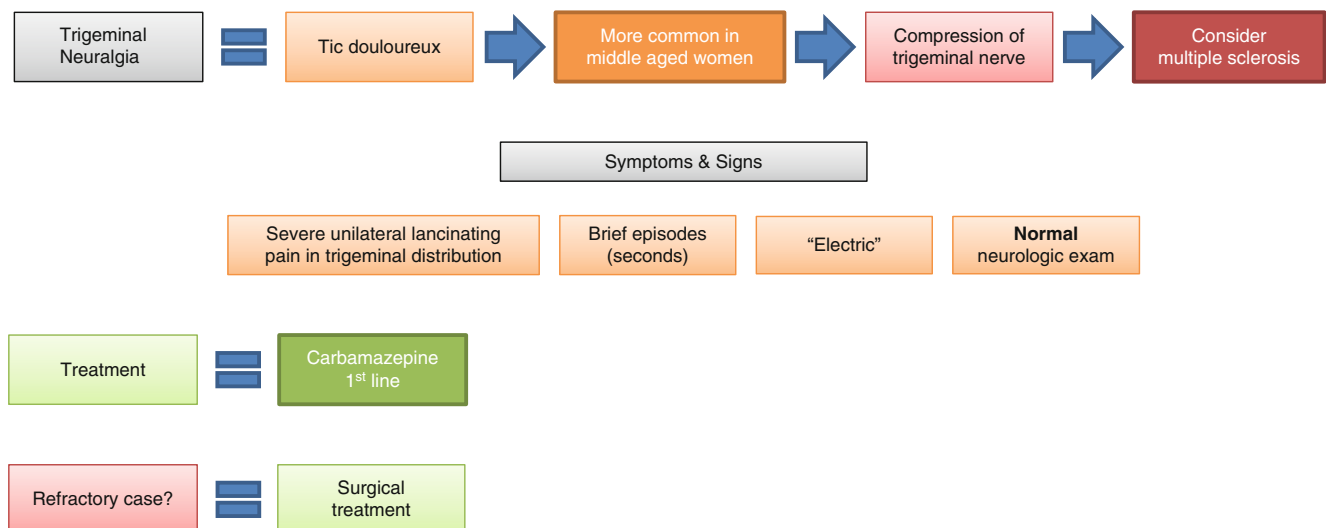
Tension Headache



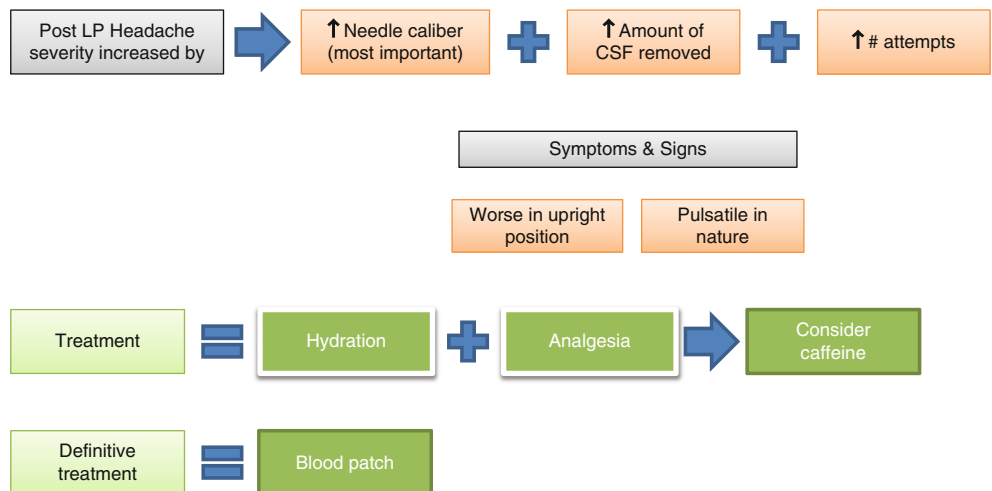
Cluster Headache



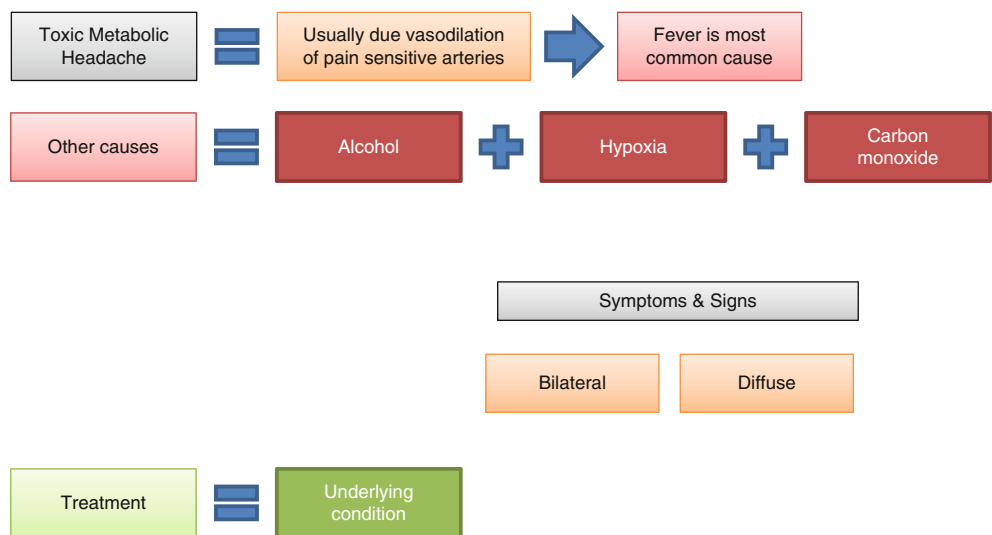
Trigeminal Neuralgia



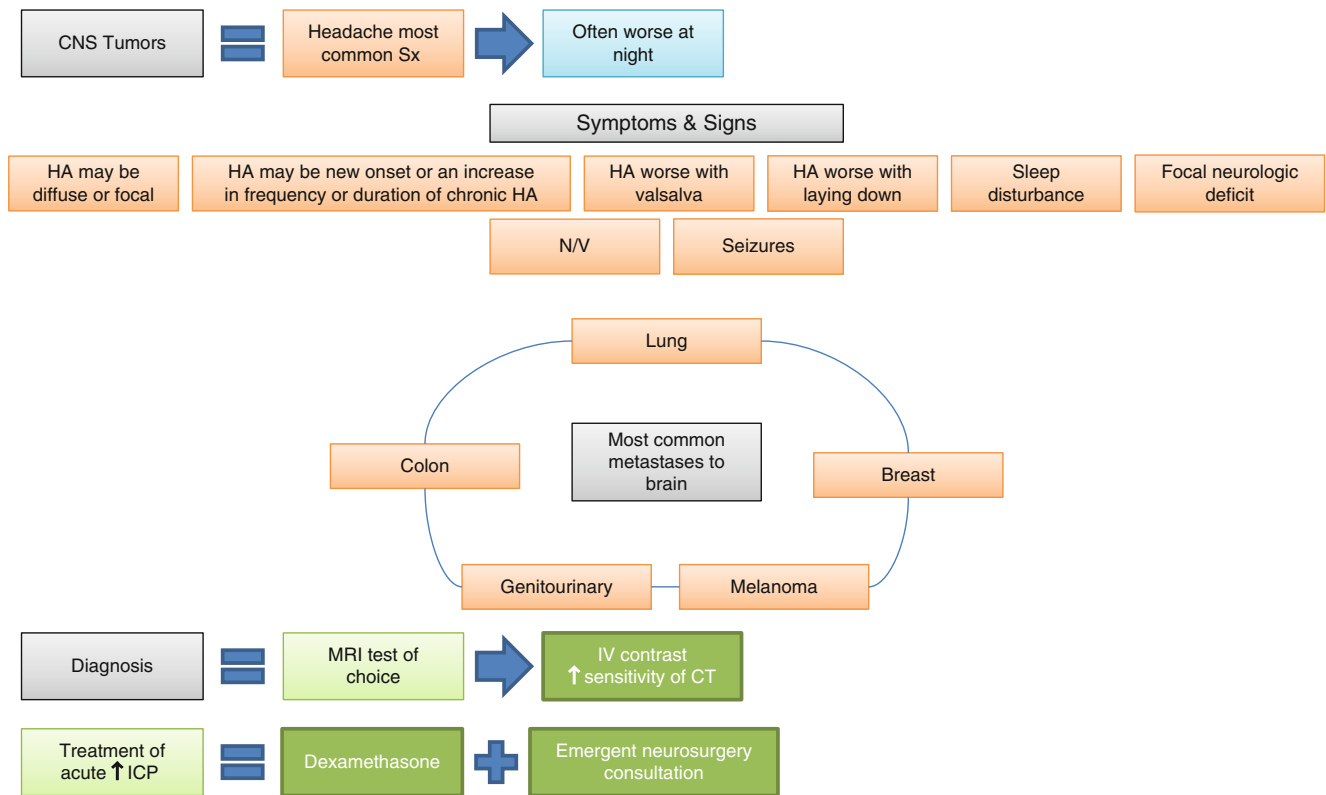
Post-lumbar Puncture Headache



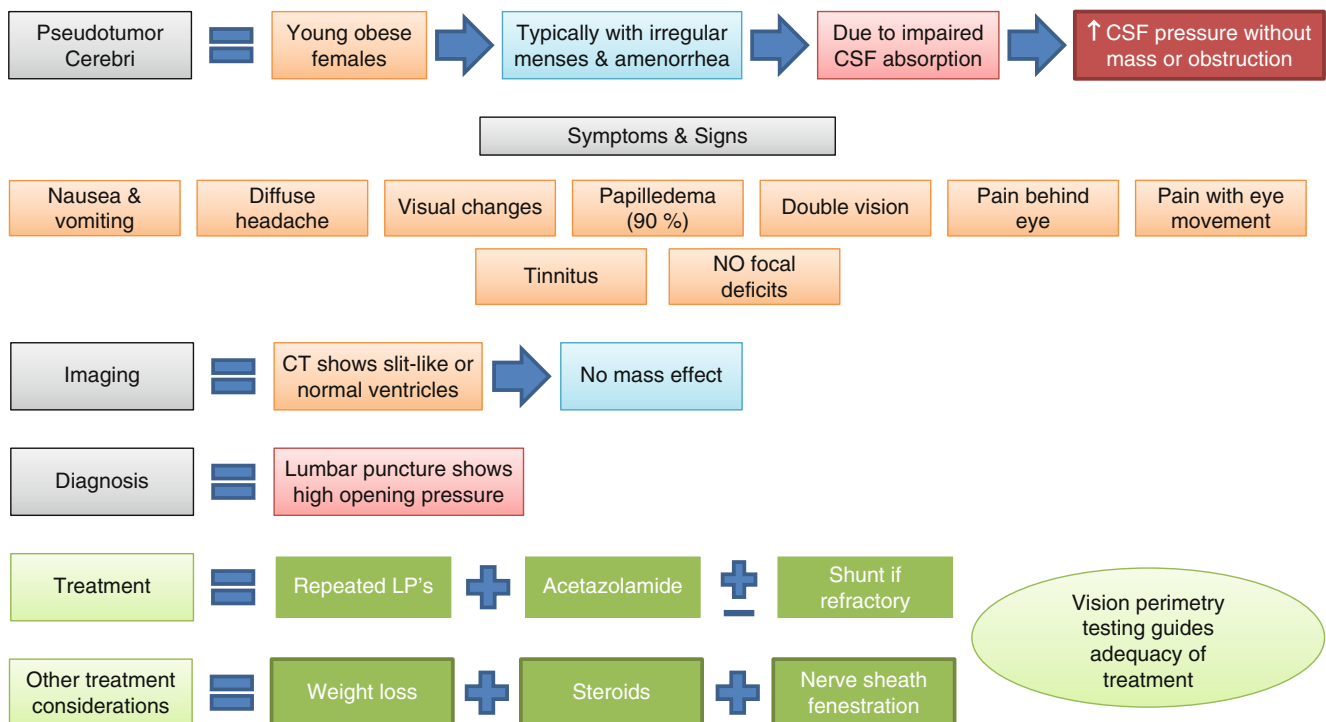
Toxic Metabolic Headache



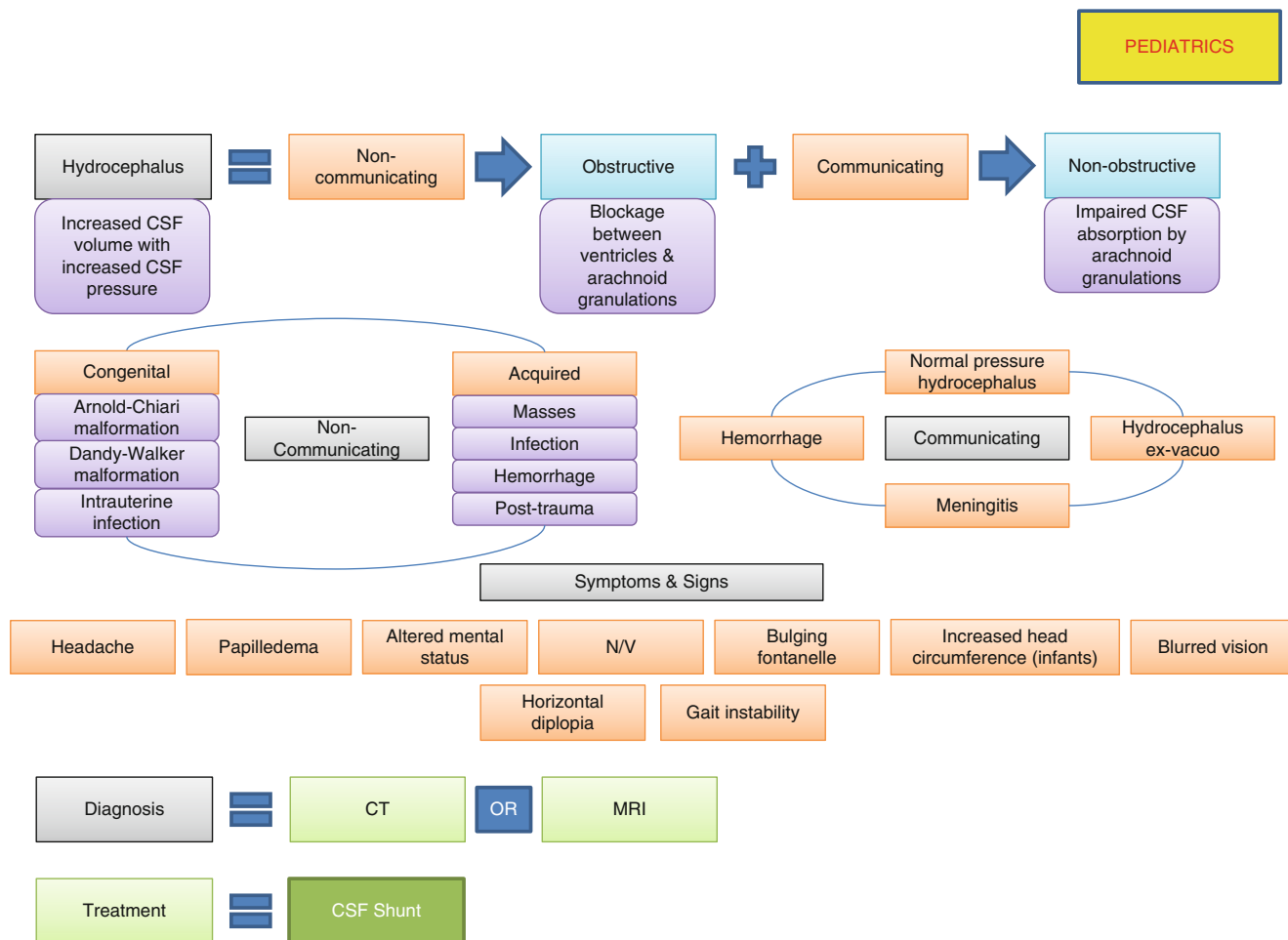
Headache Related to CNS Tumors



Pseudotumor Cerebri (Idiopathic Intracranial Hypertension)

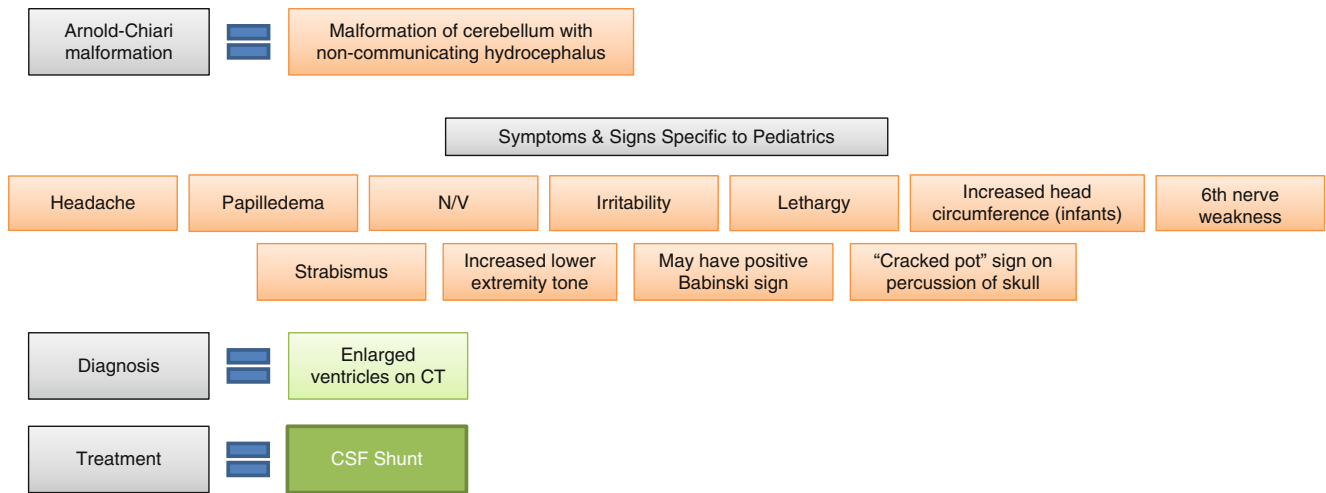


Hydrocephalus

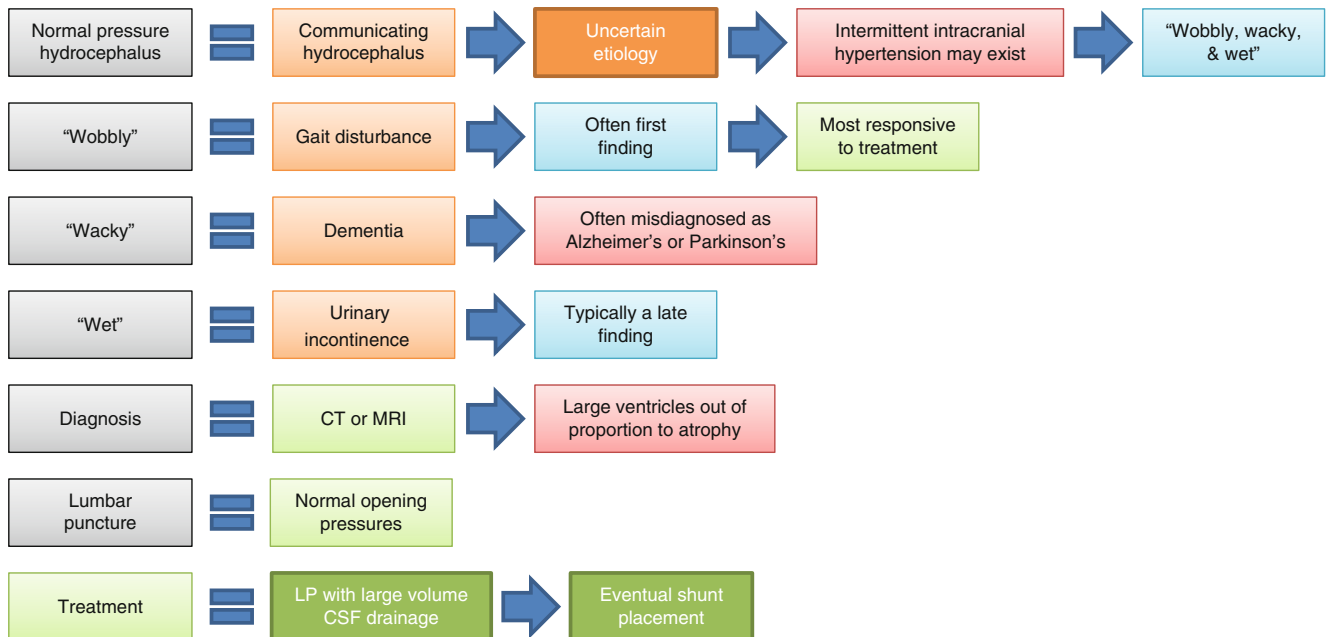


Pediatric Hydrocephalus Tidbits

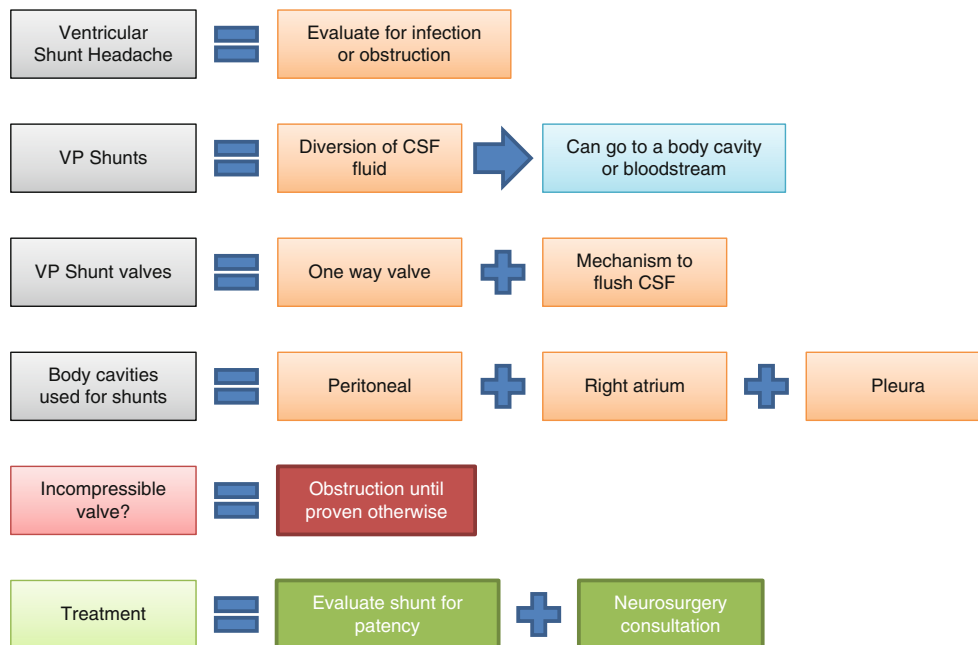
PEDIATRICS



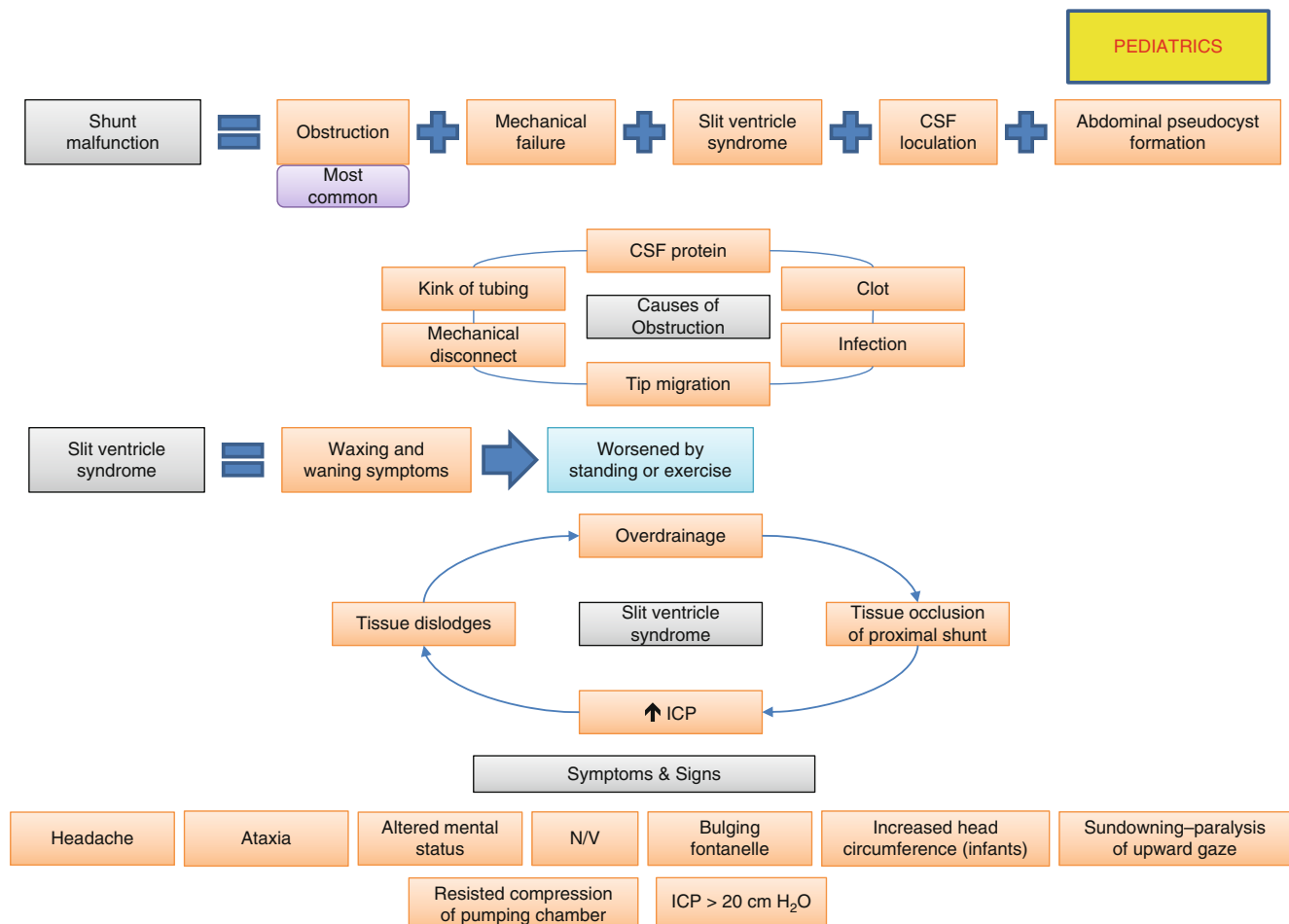
Normal Pressure Hydrocephalus



Ventricular Shunt Headache

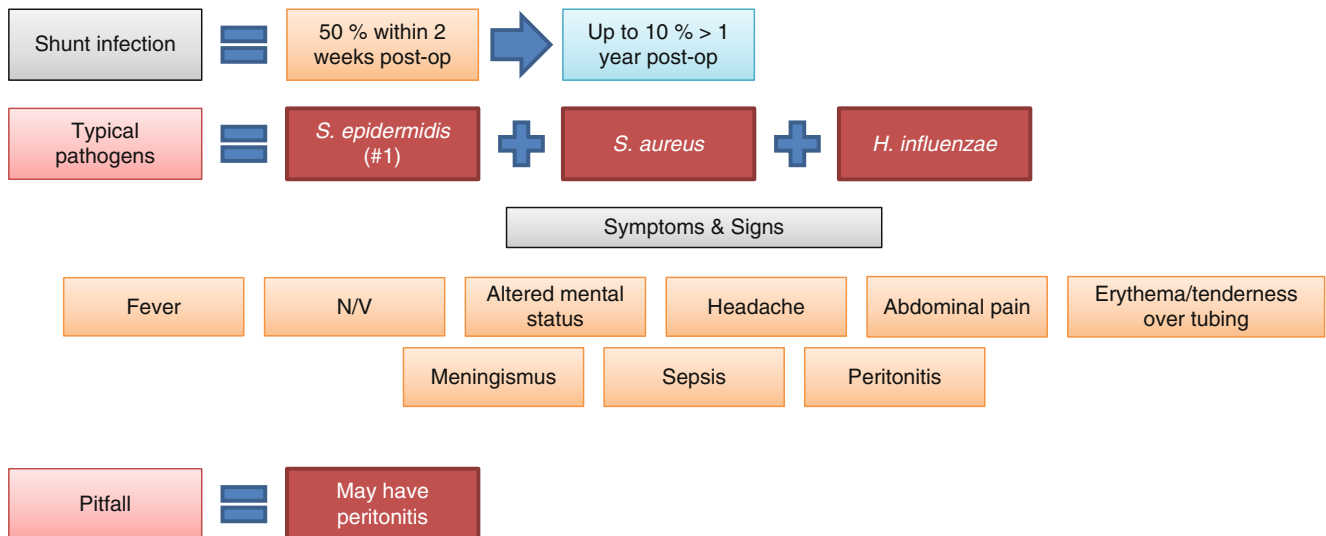


VP Shunt Complications: Malfunction

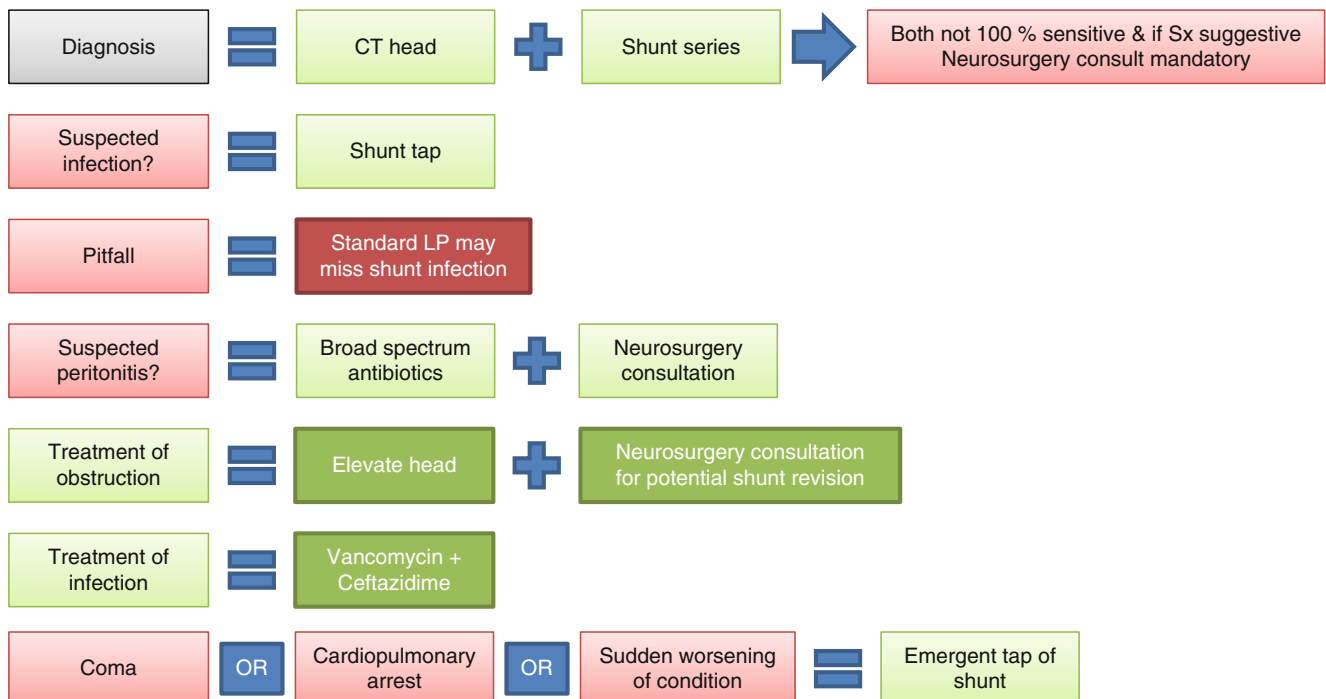


VP Shunt Complications: Infection

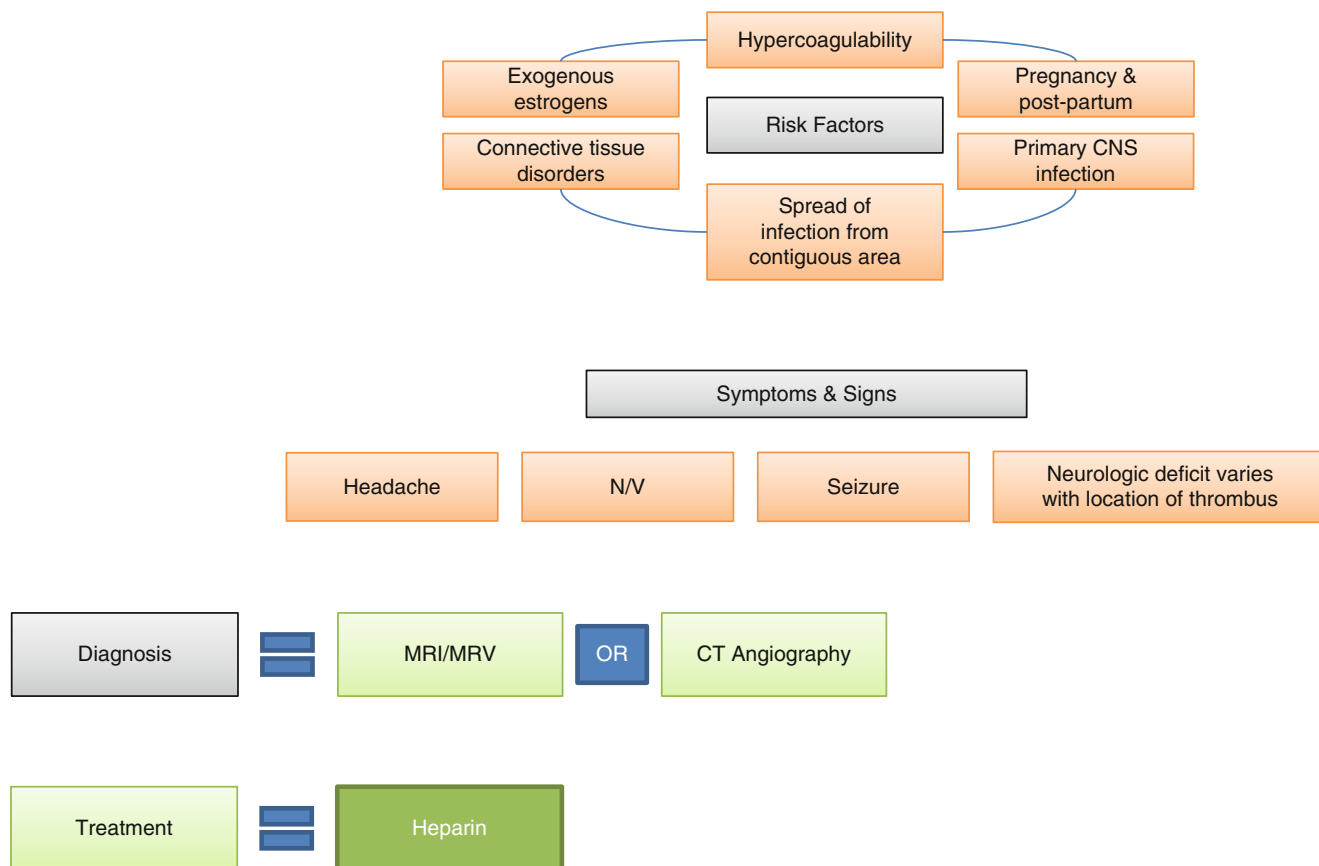
PEDIATRICS



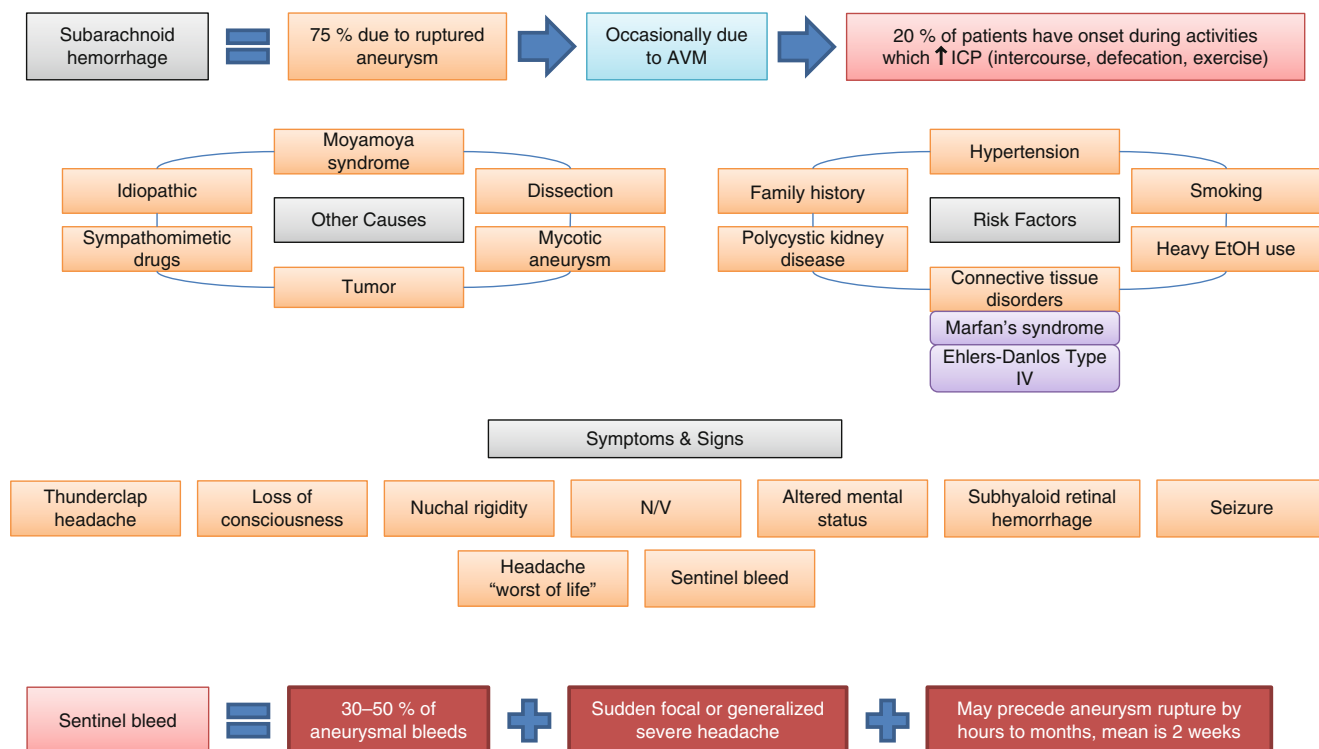
Diagnosis and Treatment of VP Shunt Complications



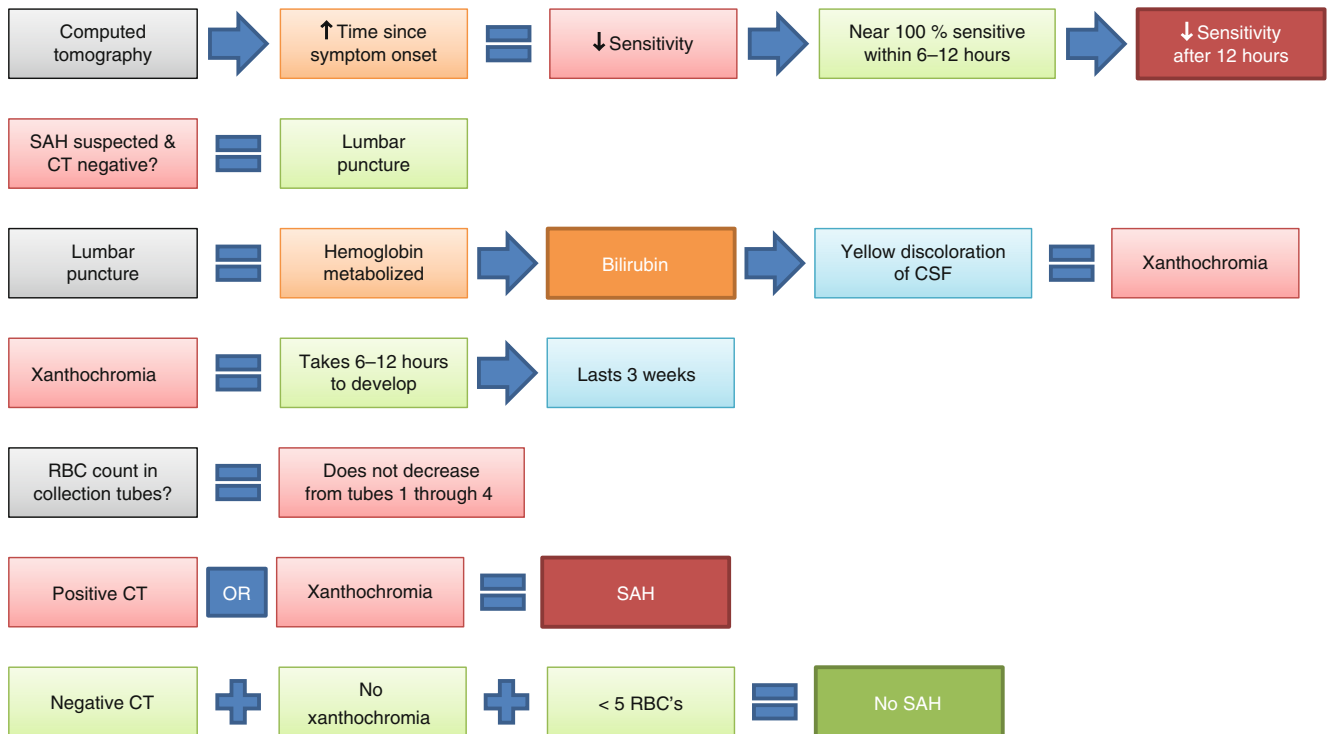
Venous Sinus Thrombosis



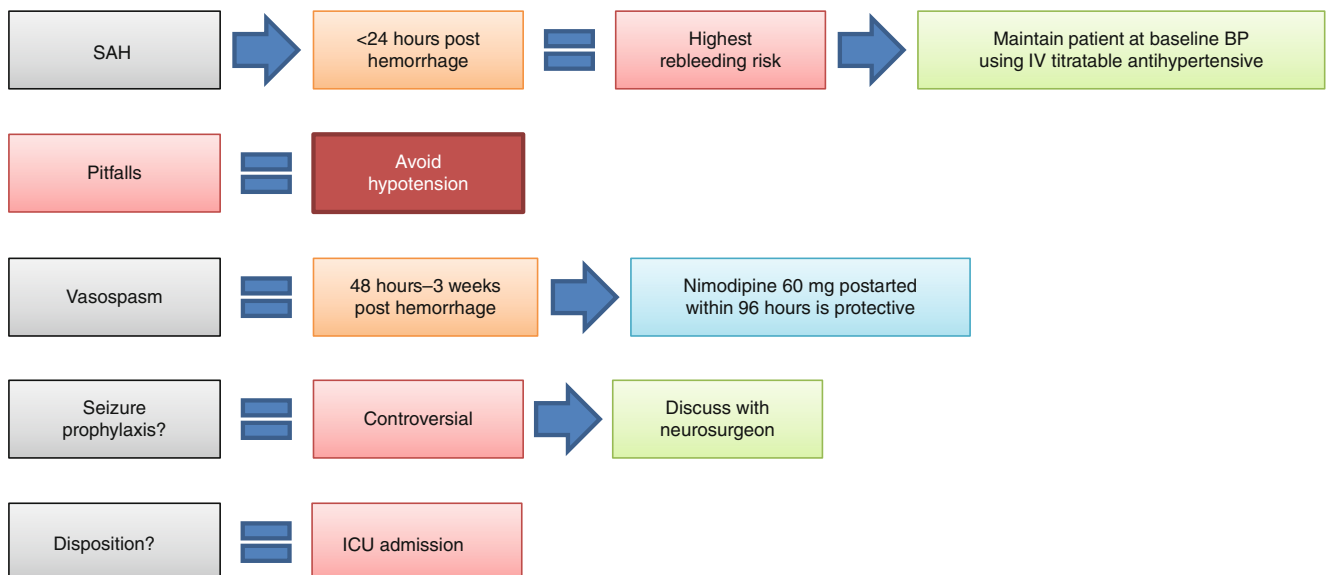
Subarachnoid Hemorrhage Introduction



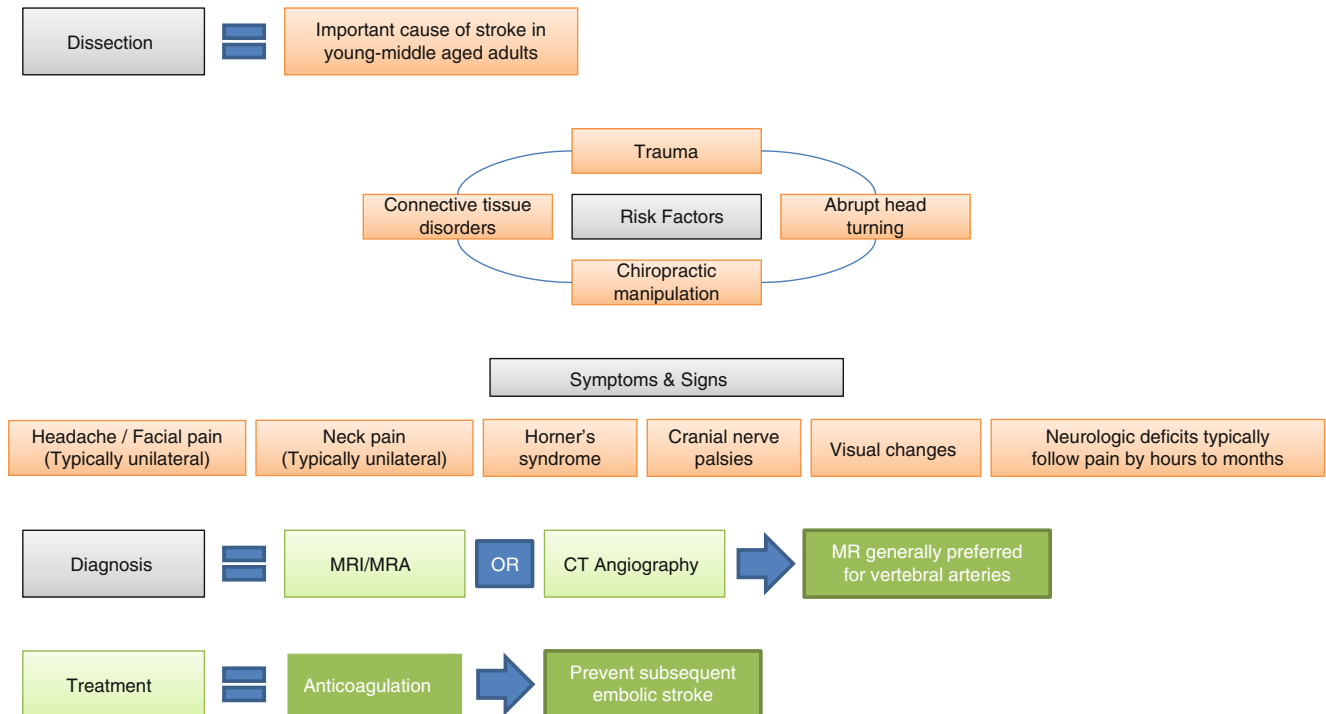
SAH Diagnosis



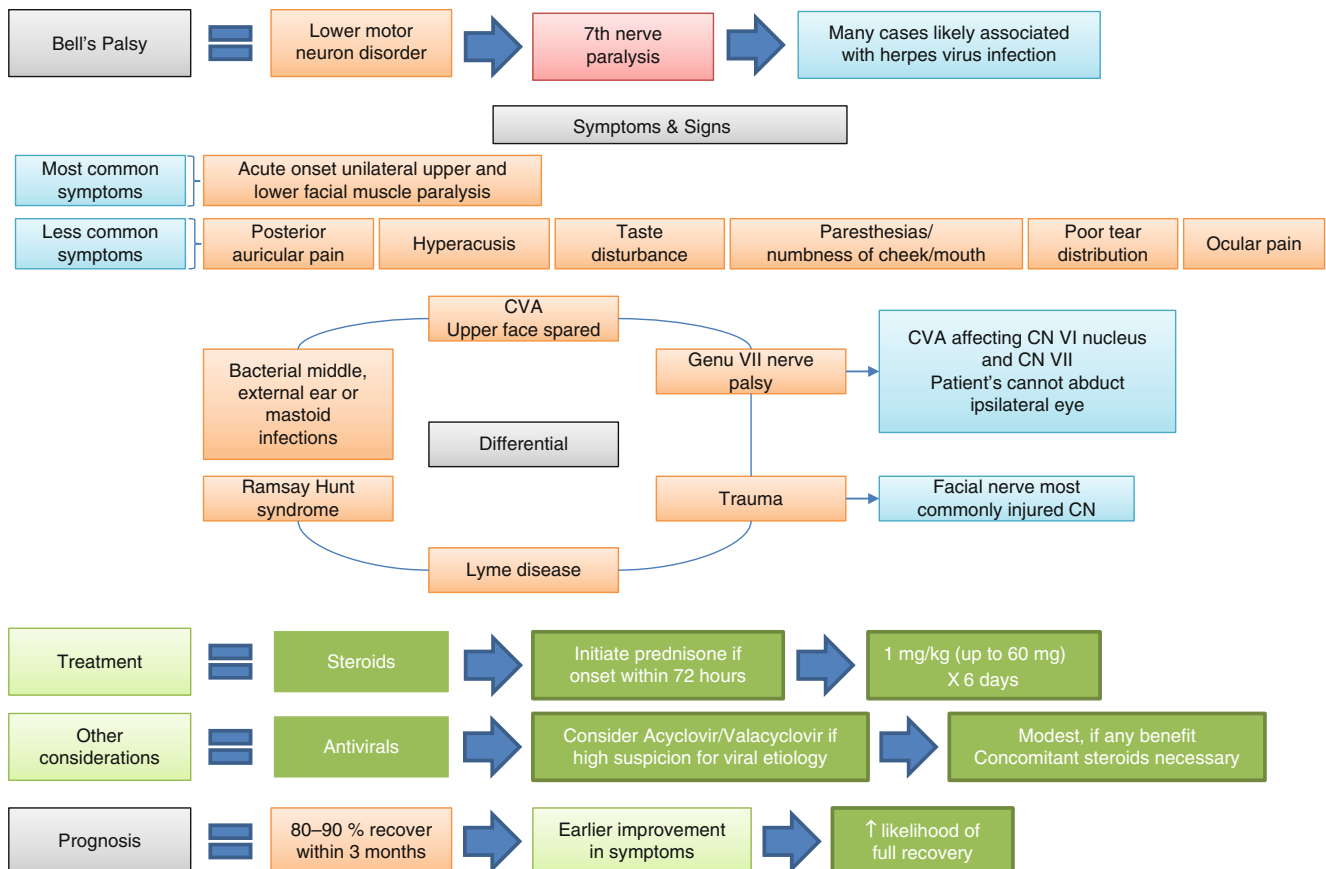
SAH Treatment and Tidbits



Carotid/Vertebral Artery Dissection

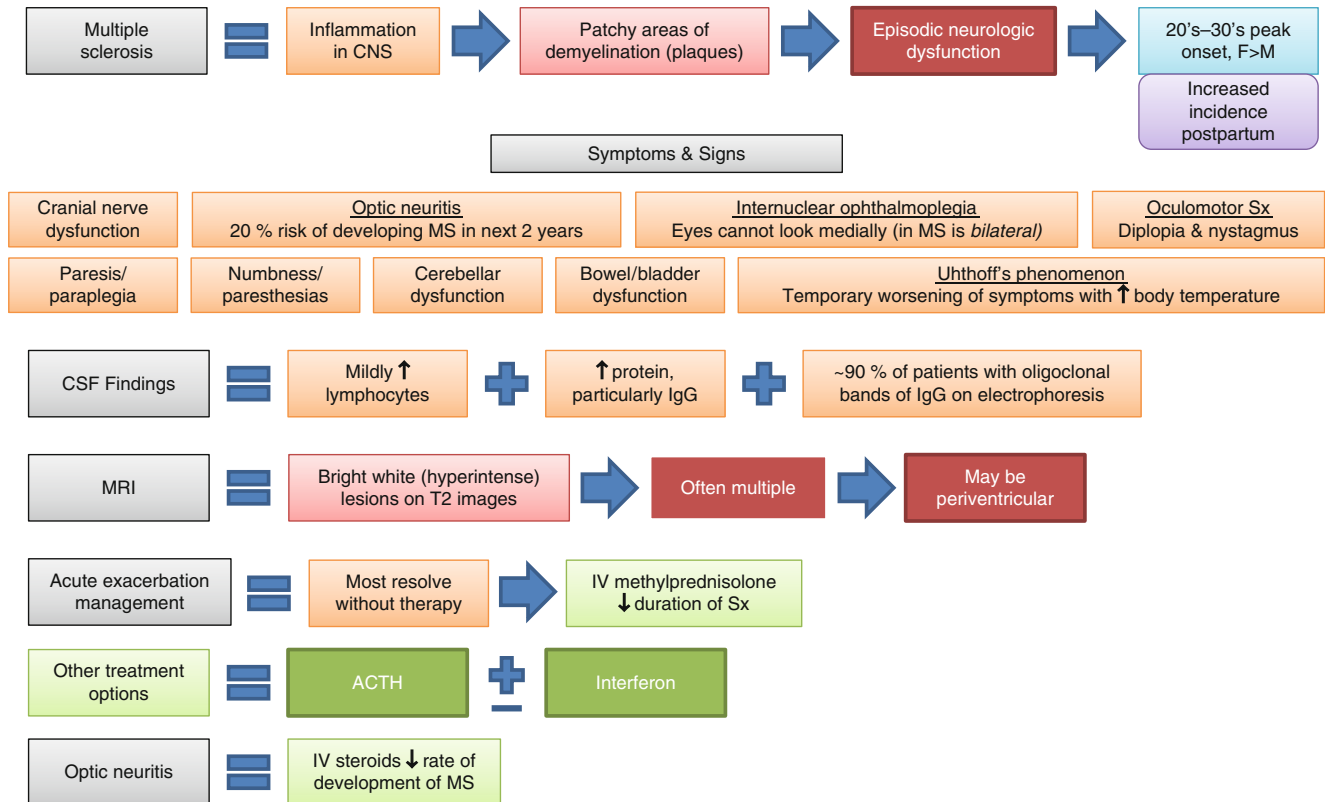


Bell's Palsy

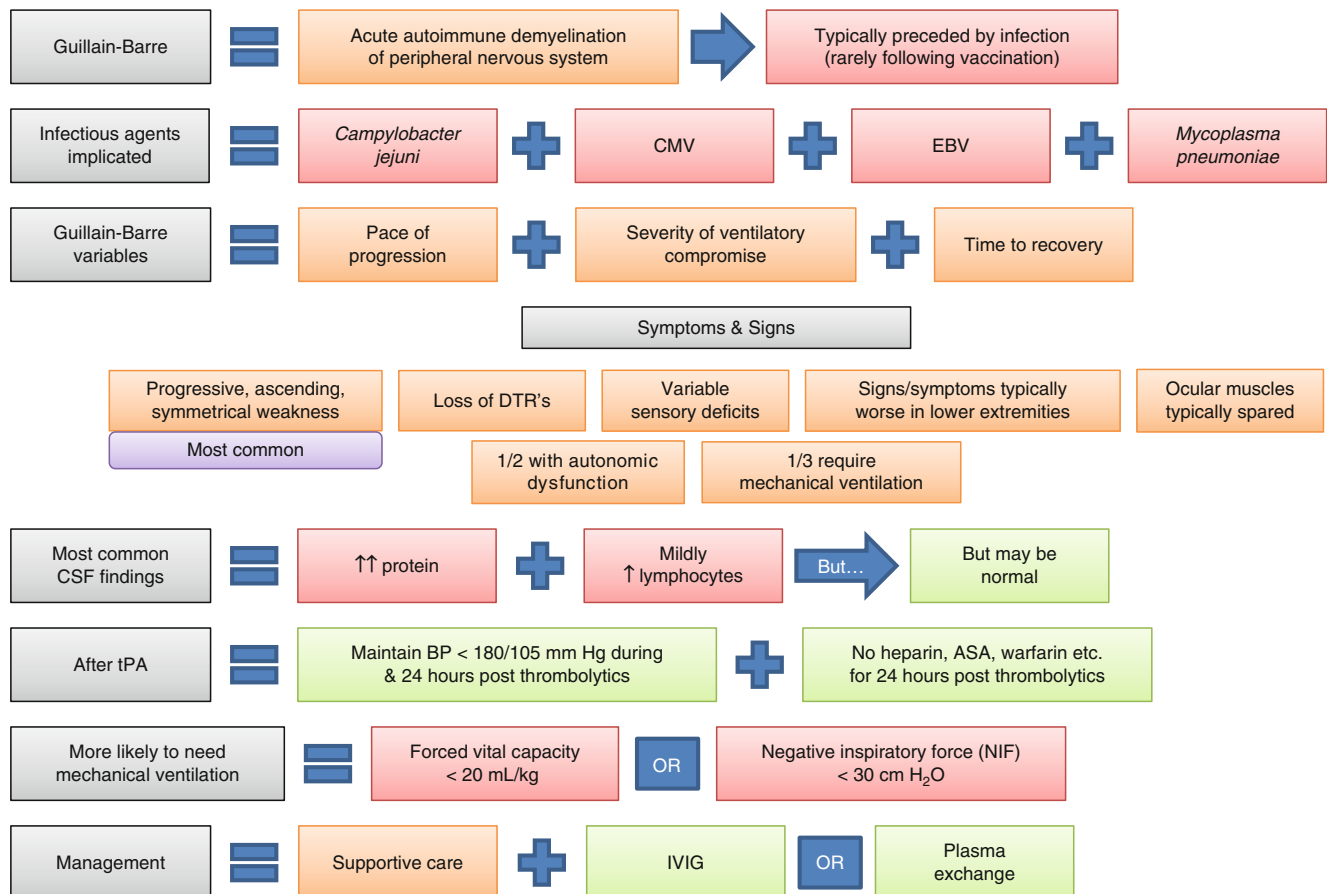


Neuromuscular Disorders

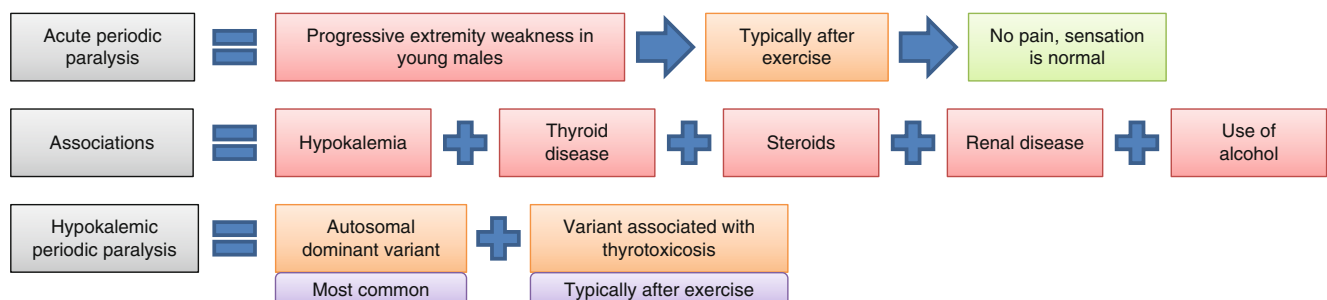
Multiple Sclerosis



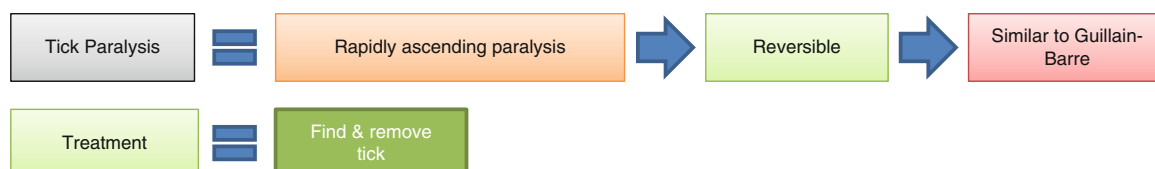
Guillain-Barre Syndrome



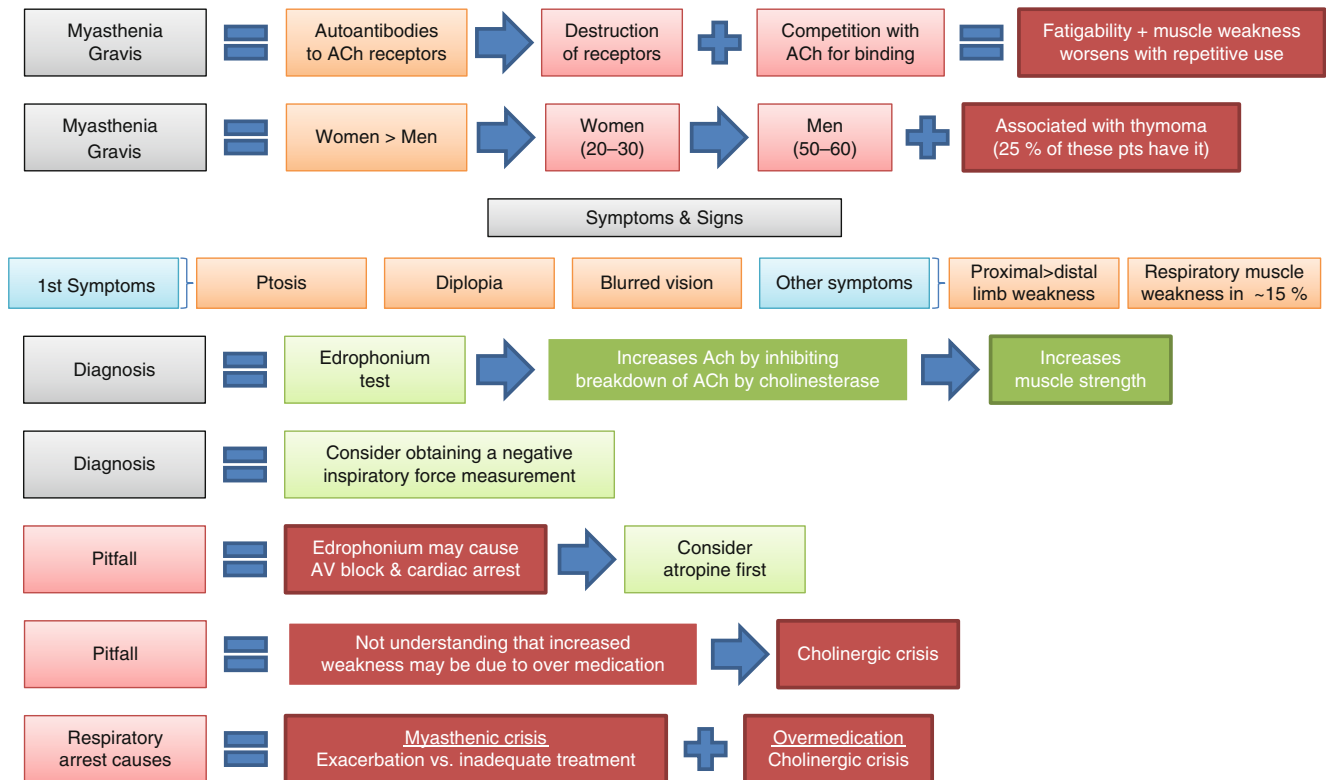
Acute Periodic Paralysis



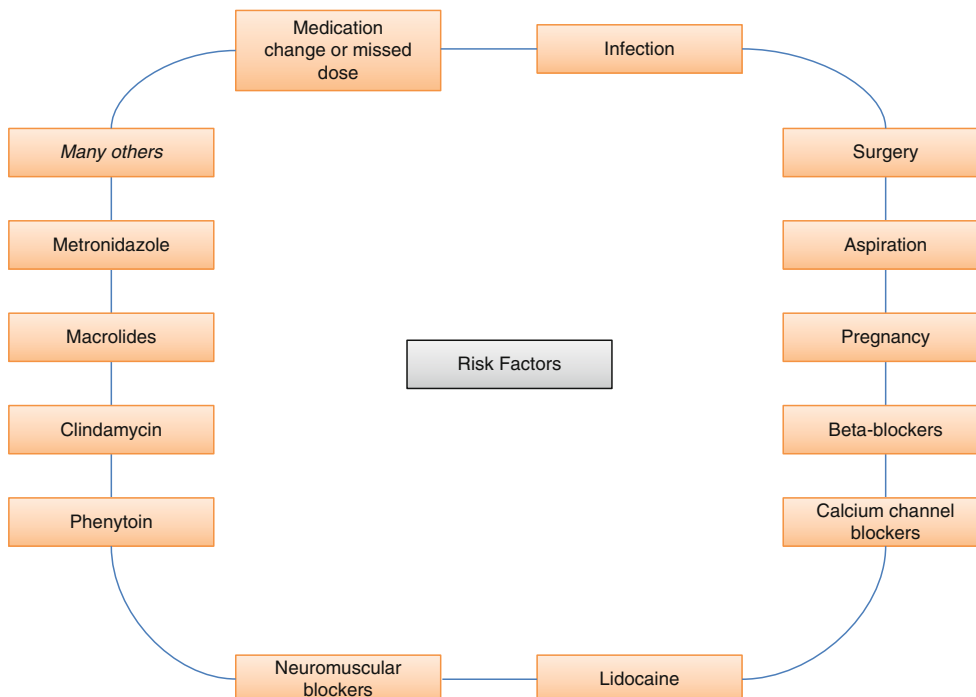
Tick Paralysis



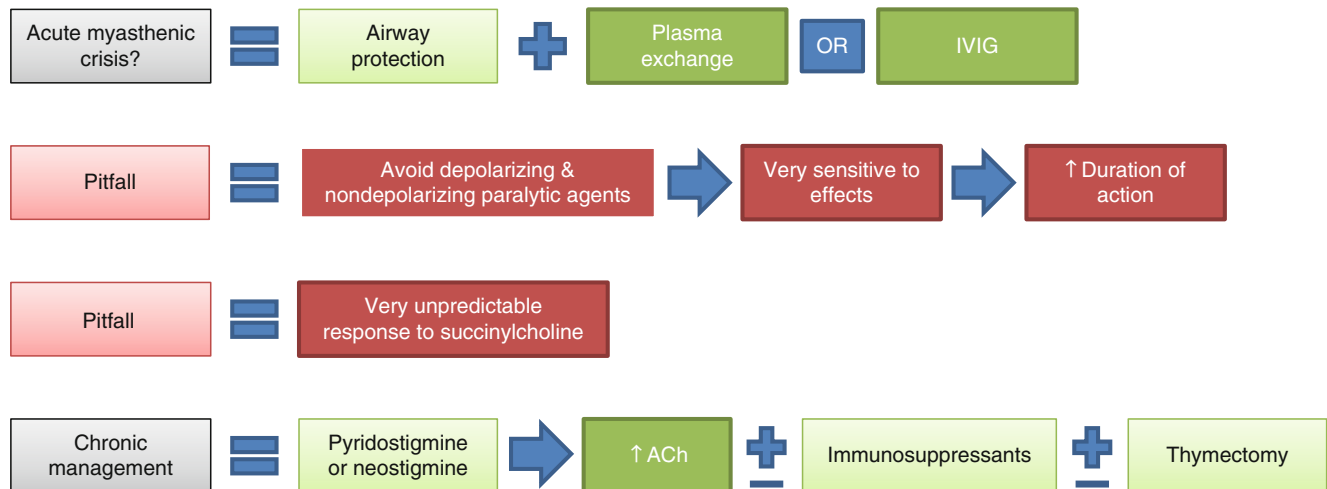
Myasthenia Gravis



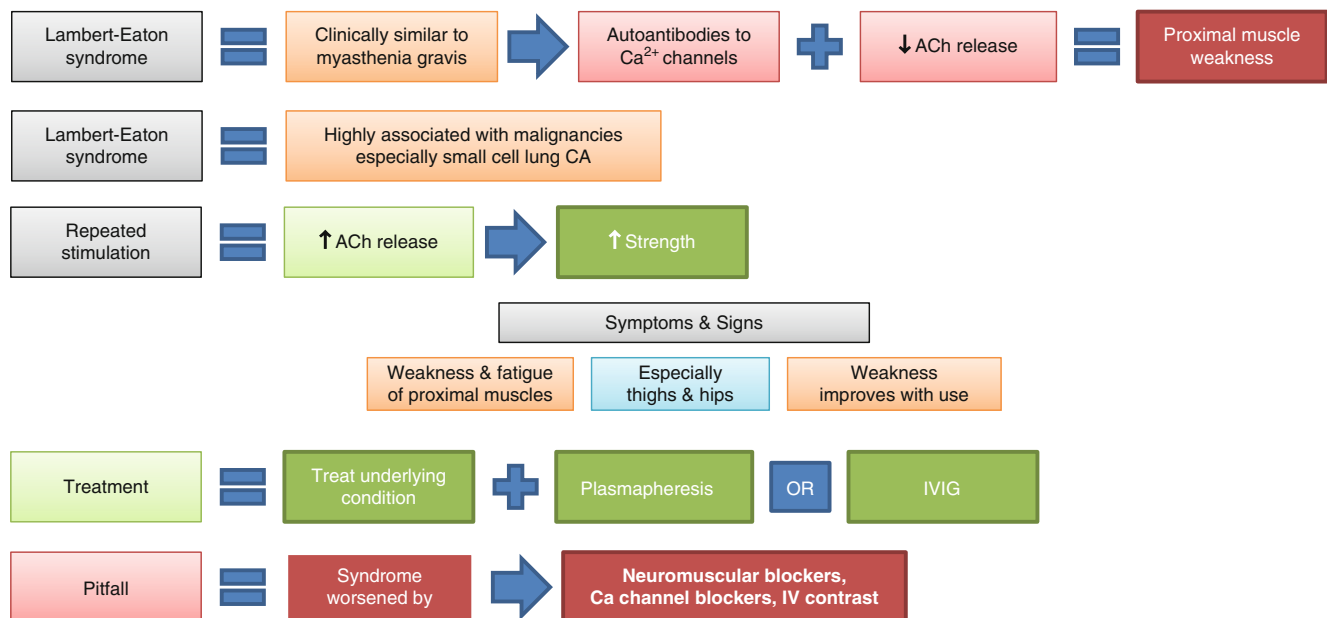
Precipitants of Myasthenic Crisis



Myasthenia Gravis Treatment

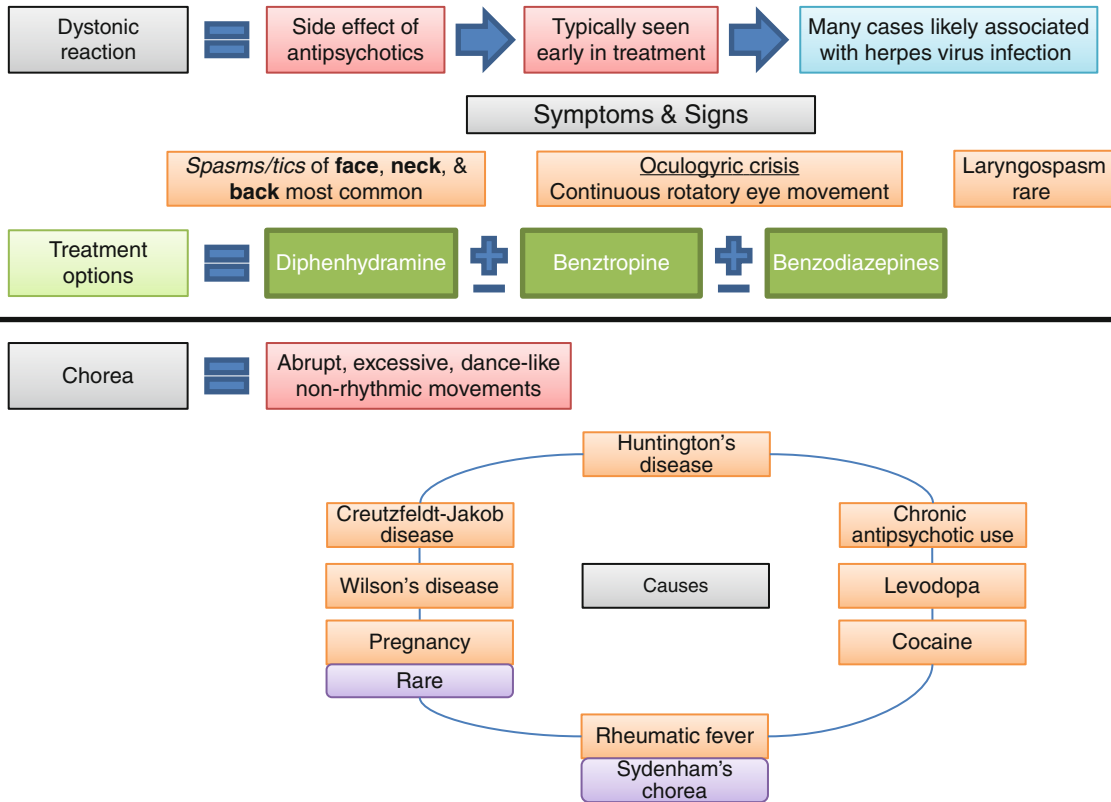


Lambert-Eaton Myasthenic Syndrome



Movement Disorders

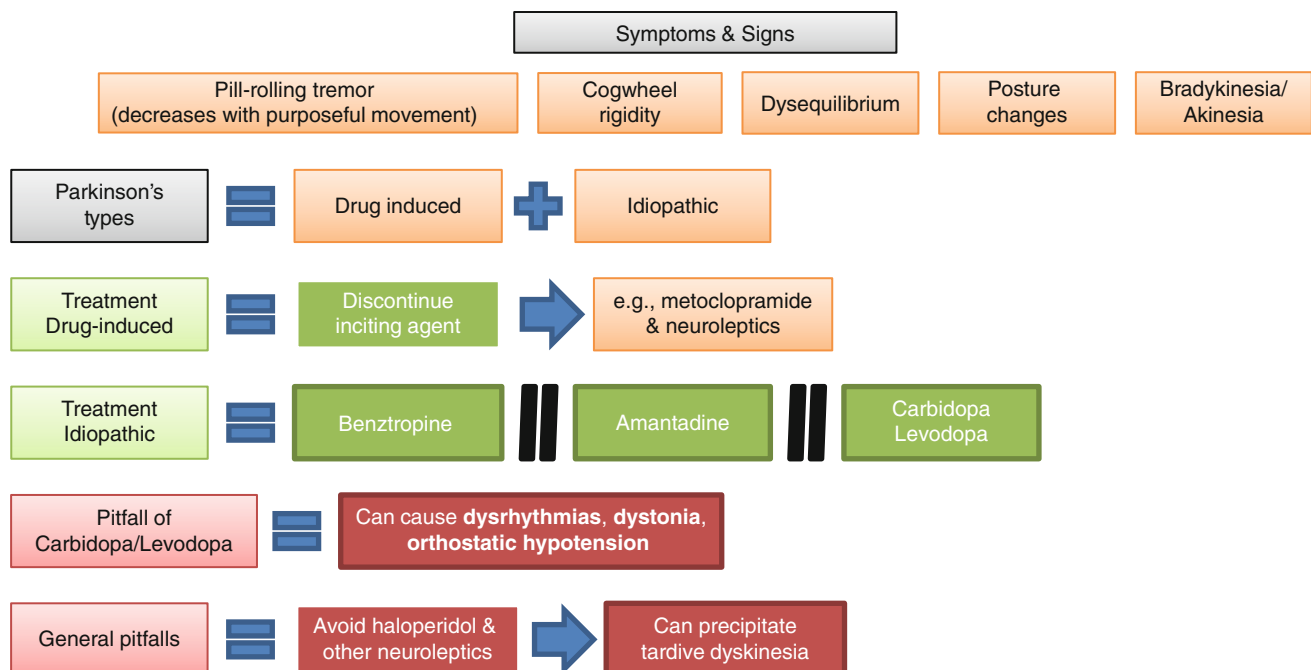
Movement Disorders: Dystonic Reaction and Chorea



Movement Disorders: Akathisia and Tardive Dyskinesia

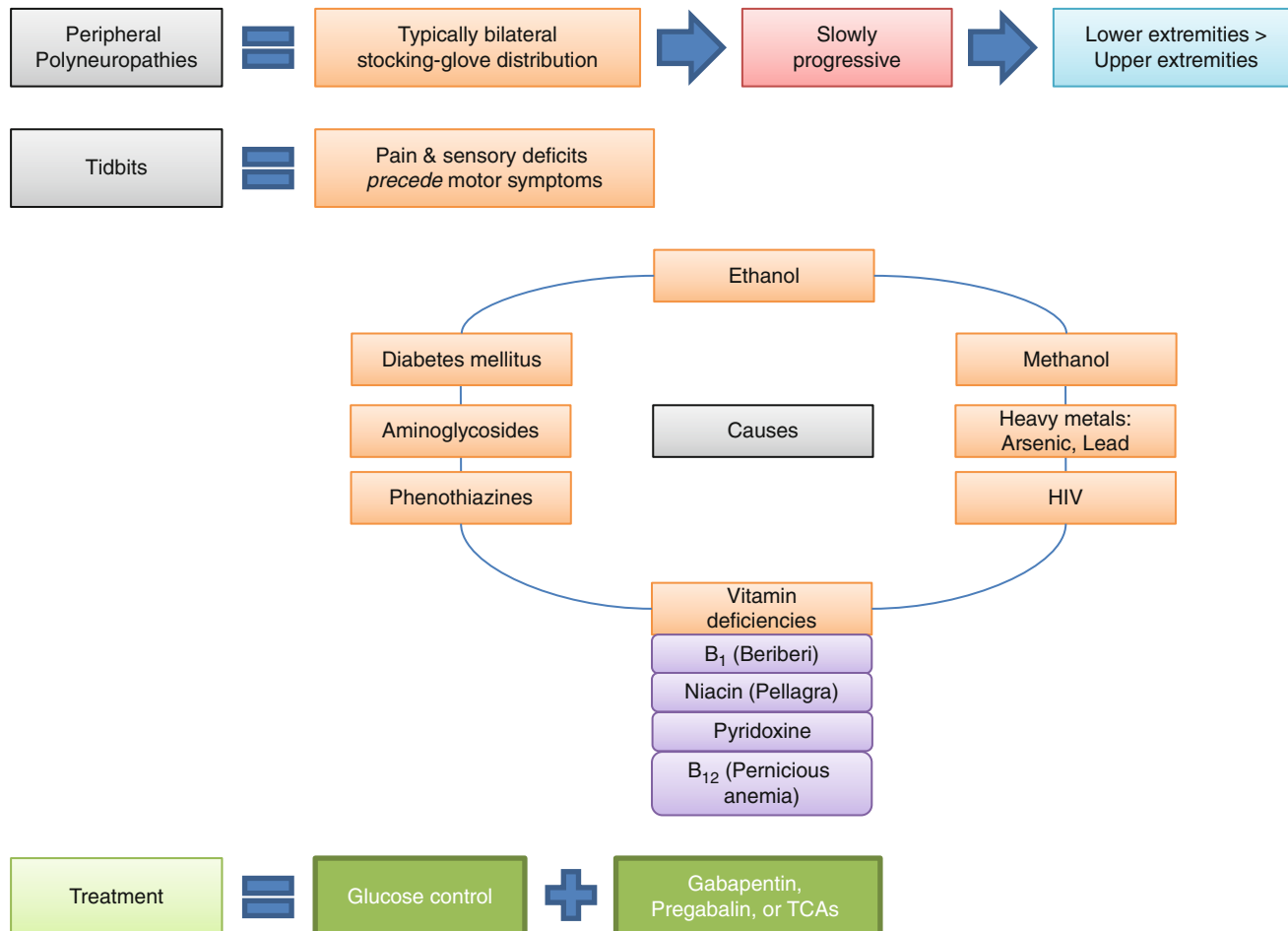


Parkinson's Disease



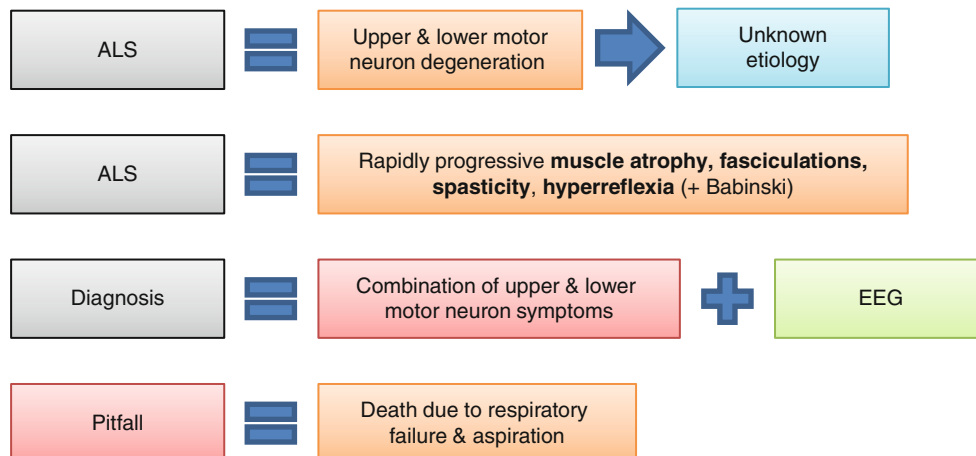
Neuropathies

Peripheral Polyneuropathies



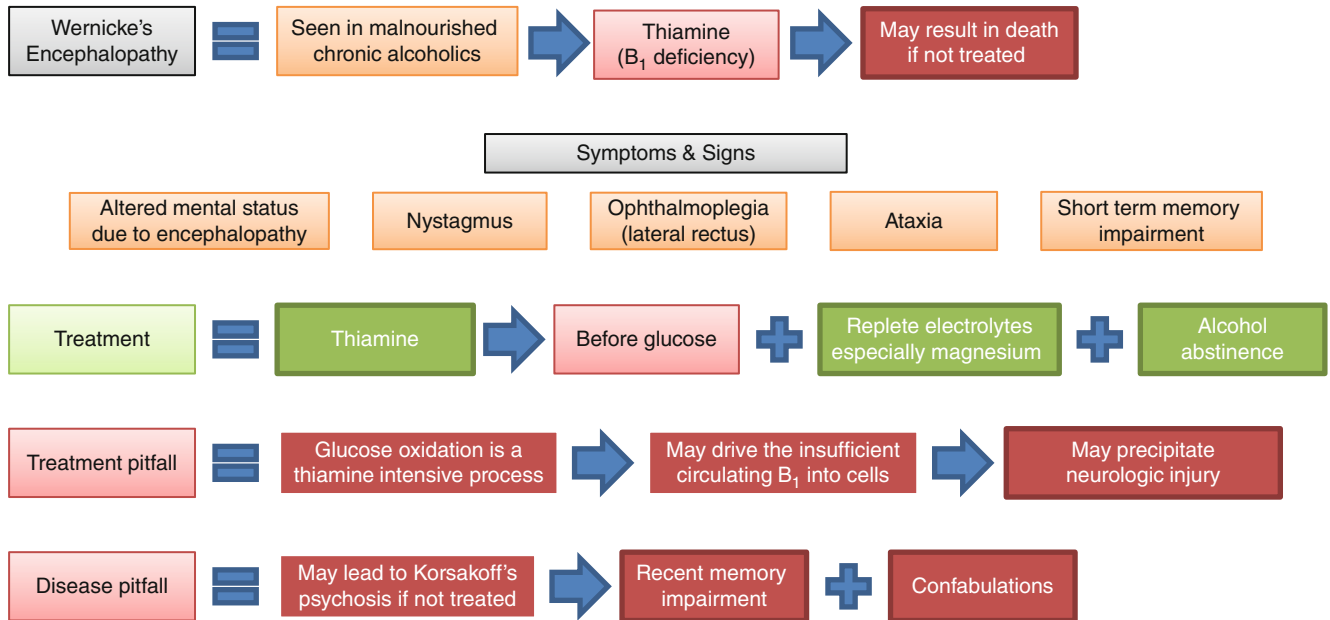
Spinal Disorders

Amyotrophic Lateral Sclerosis



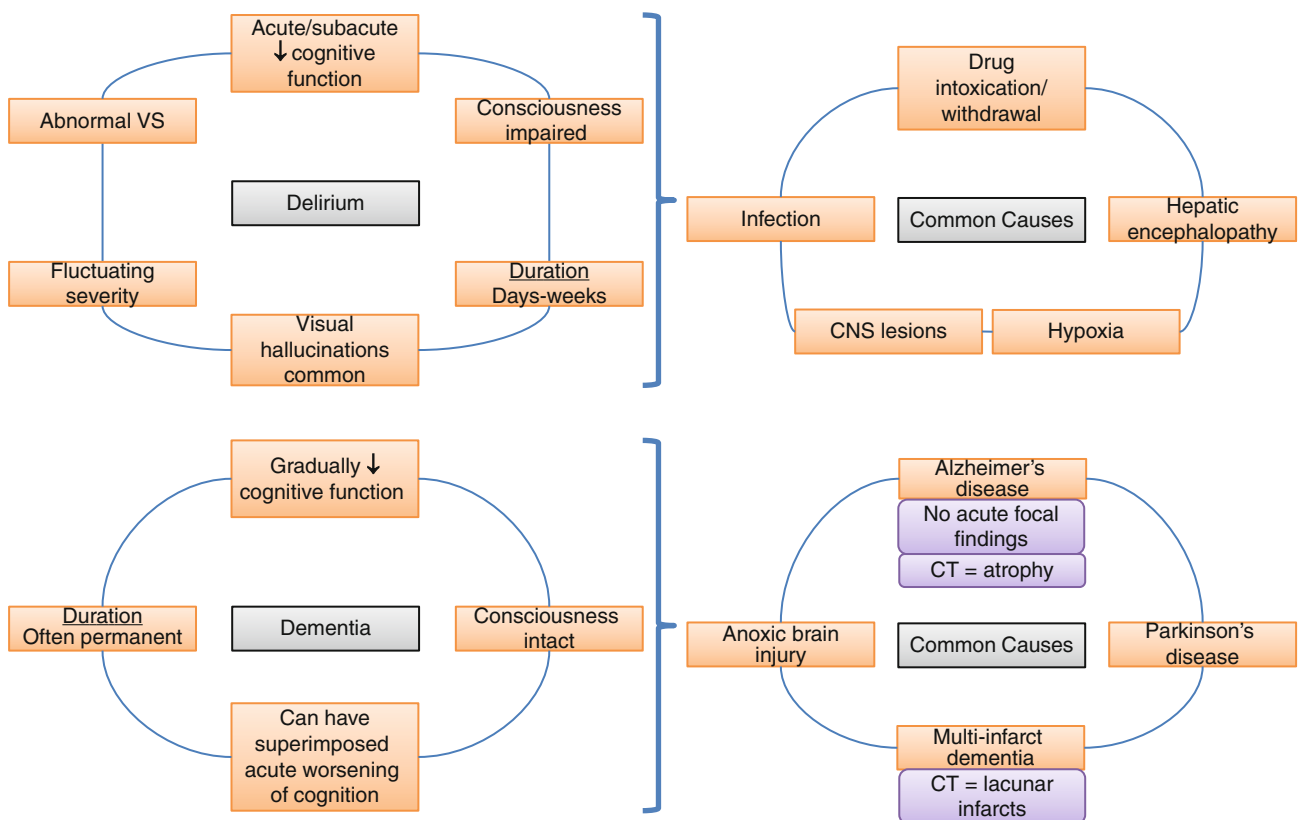
Miscellaneous Disorders

Wernicke's Encephalopathy

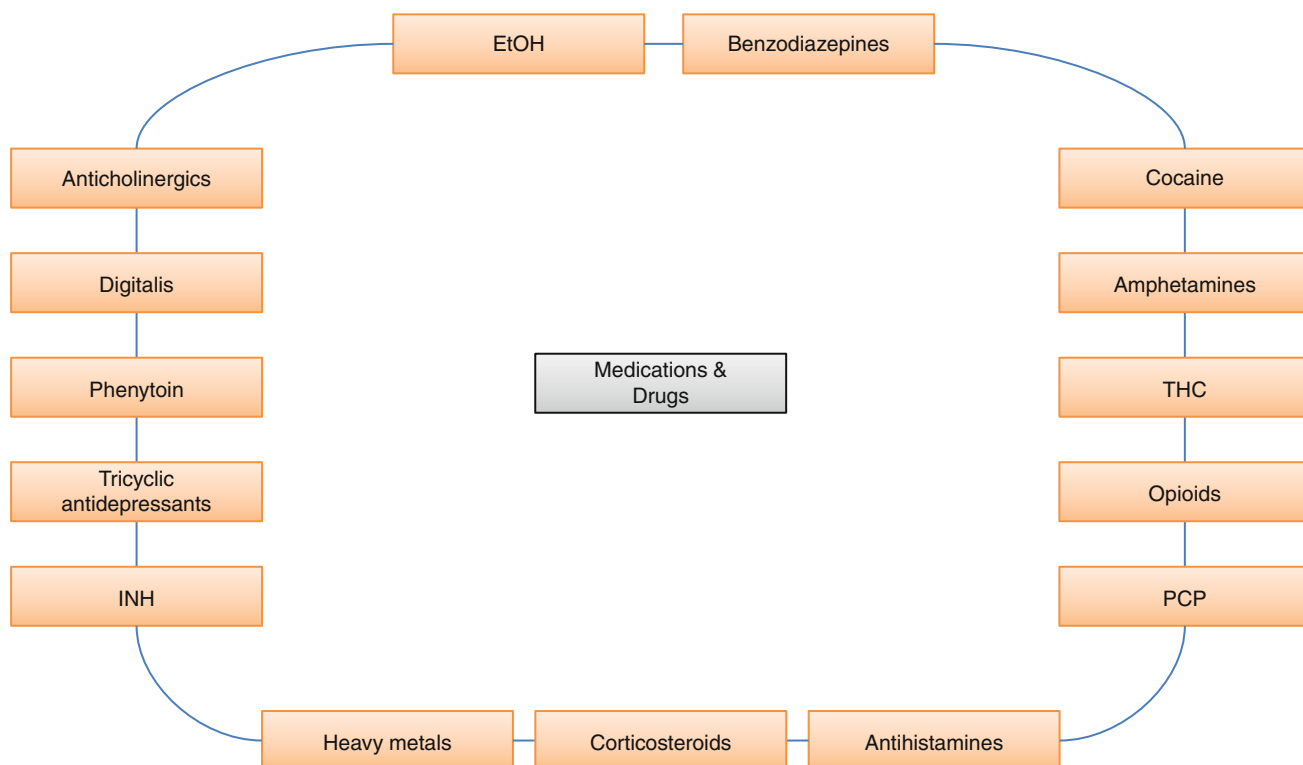


Psychiatric Emergencies

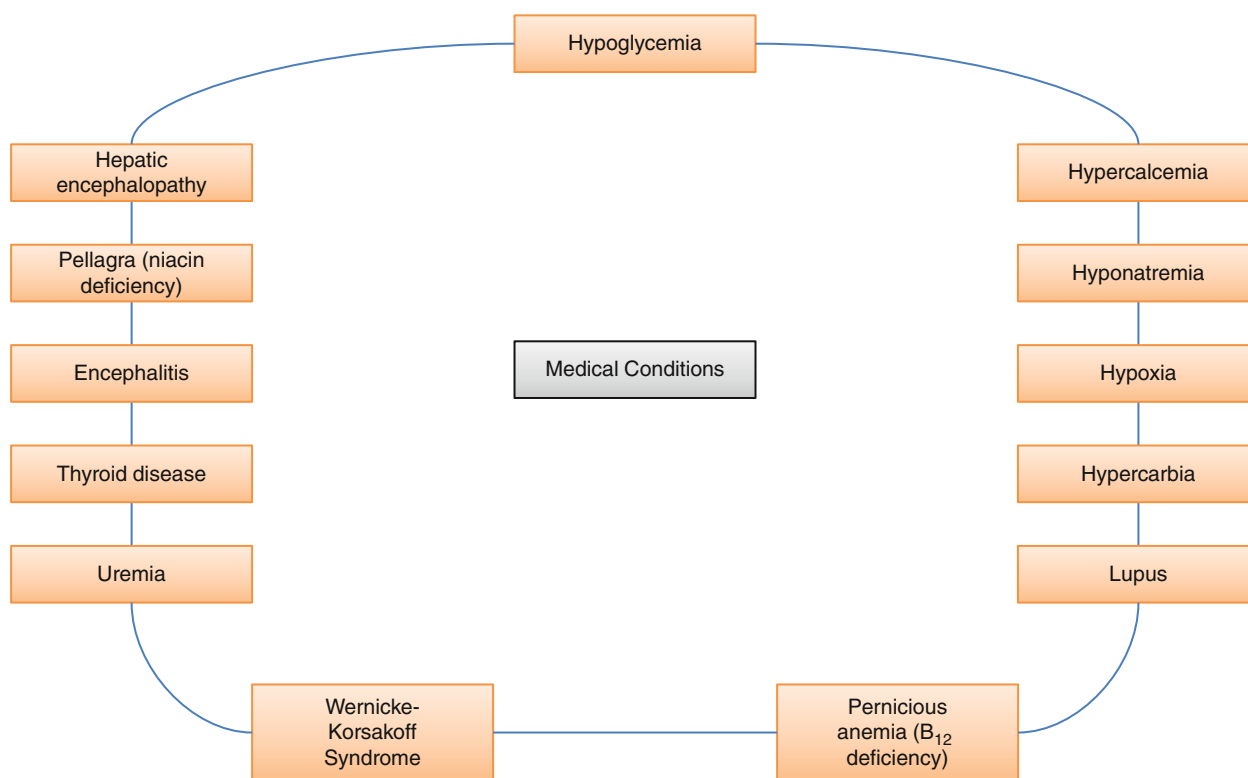
Delirium Versus Dementia



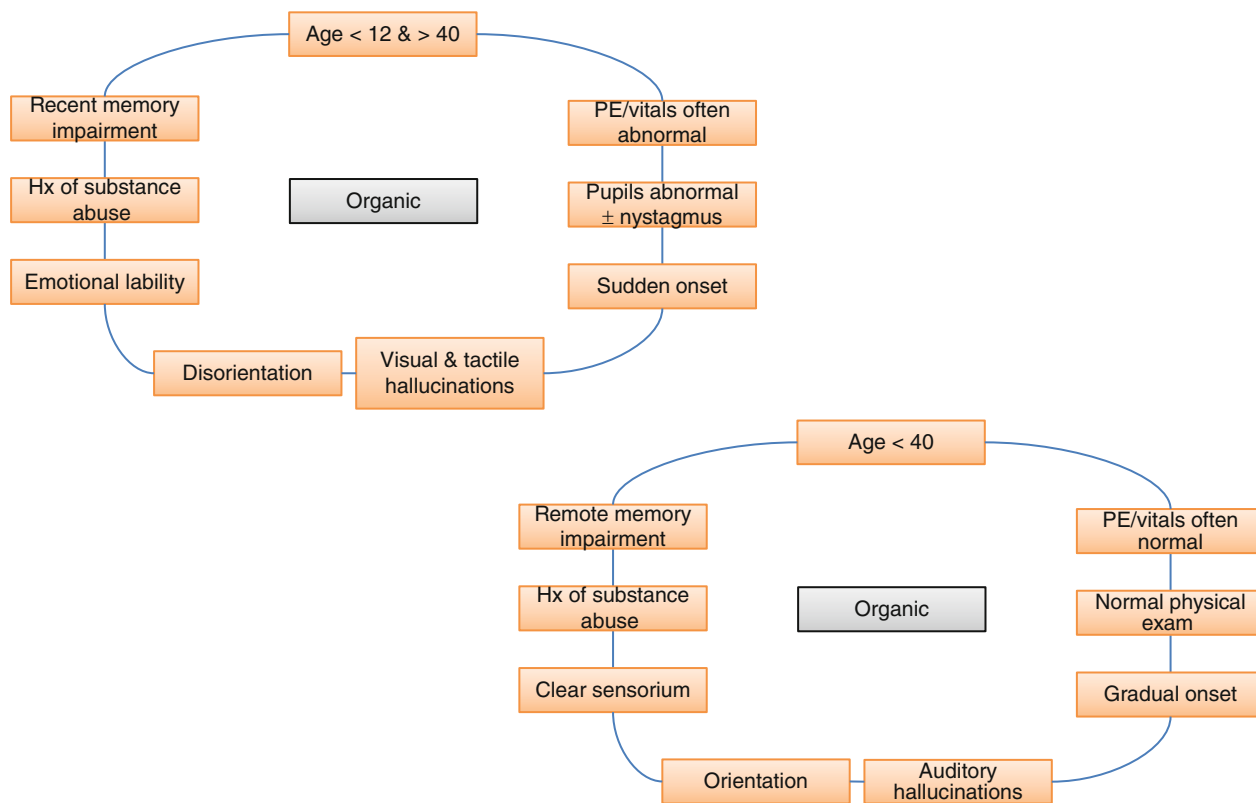
Organic Acute Psychosis Etiologies Medications/Drugs (Including Withdrawal)



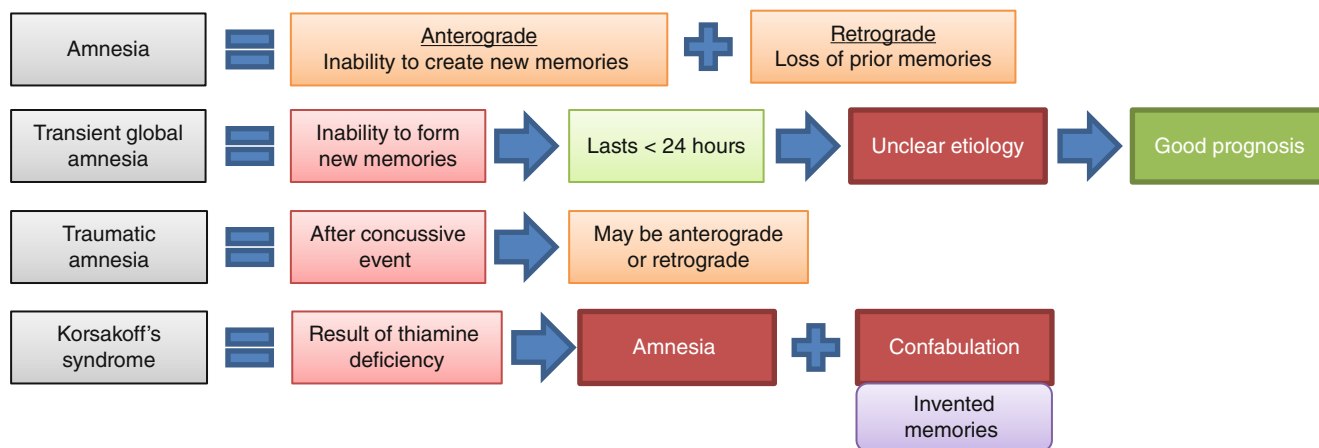
Organic Acute Psychosis Etiologies Medical Conditions



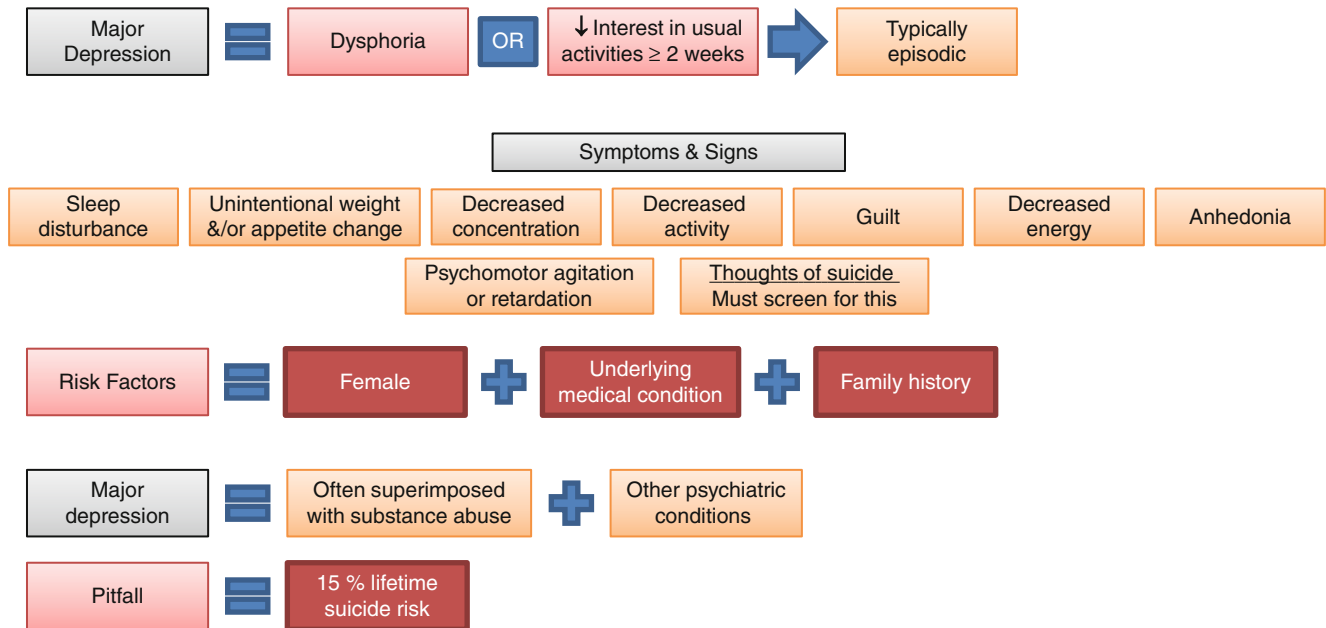
Organic Versus Functional Psychosis



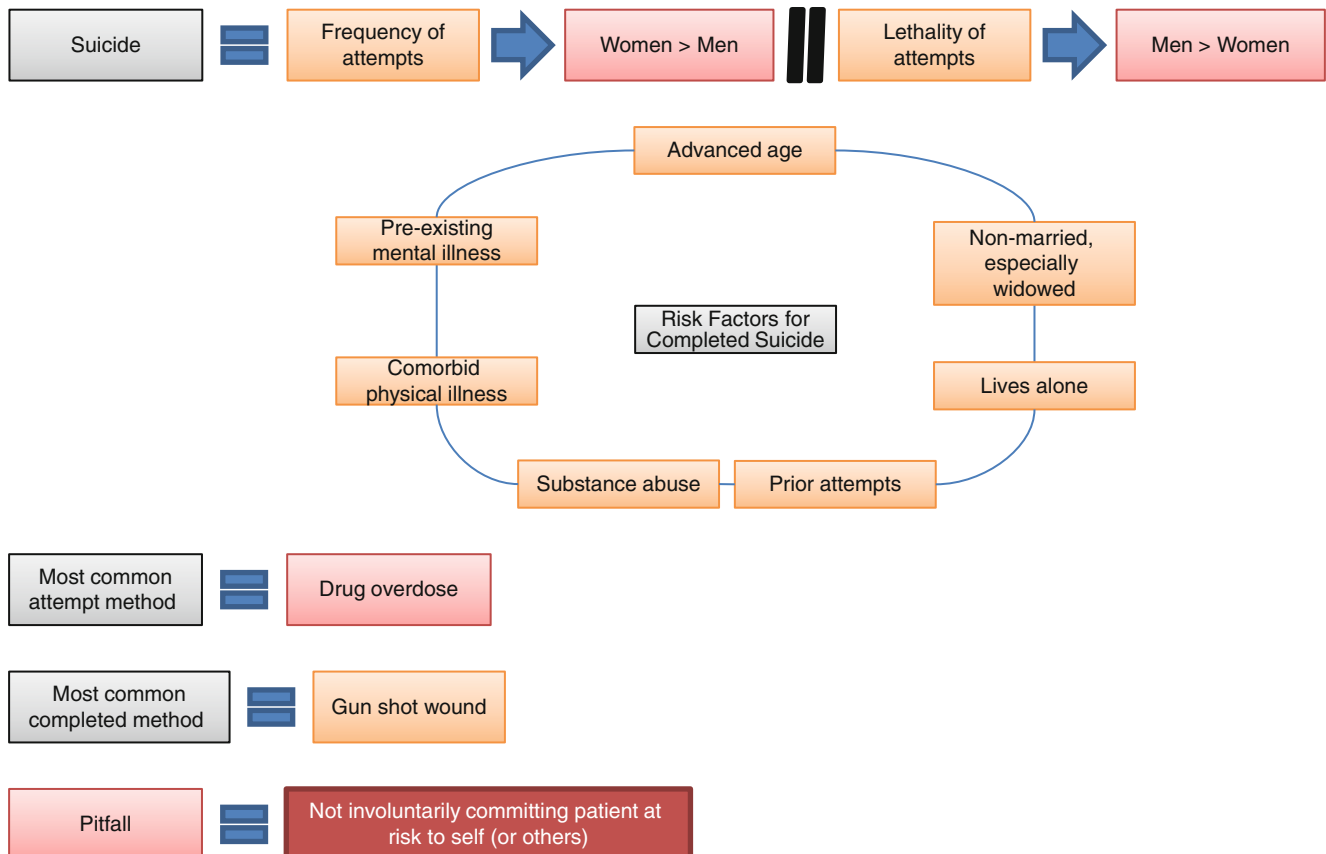
Amnesia



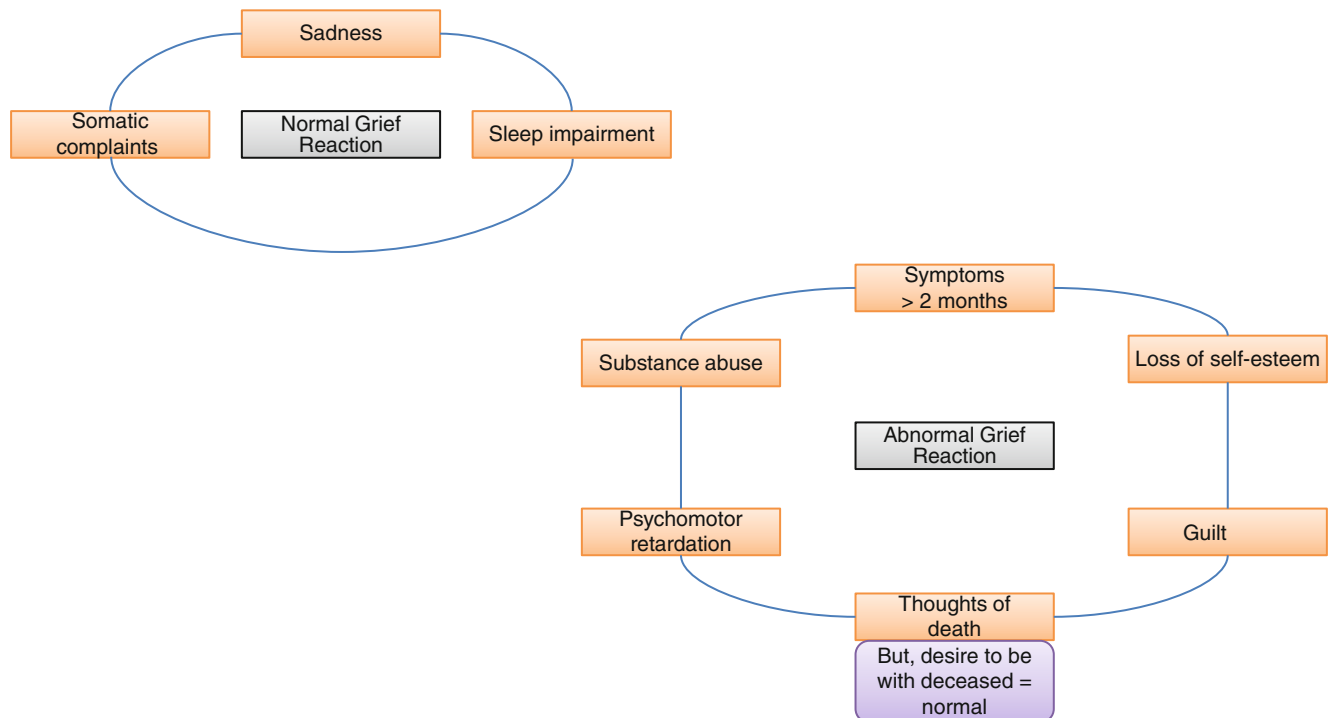
Major Depression



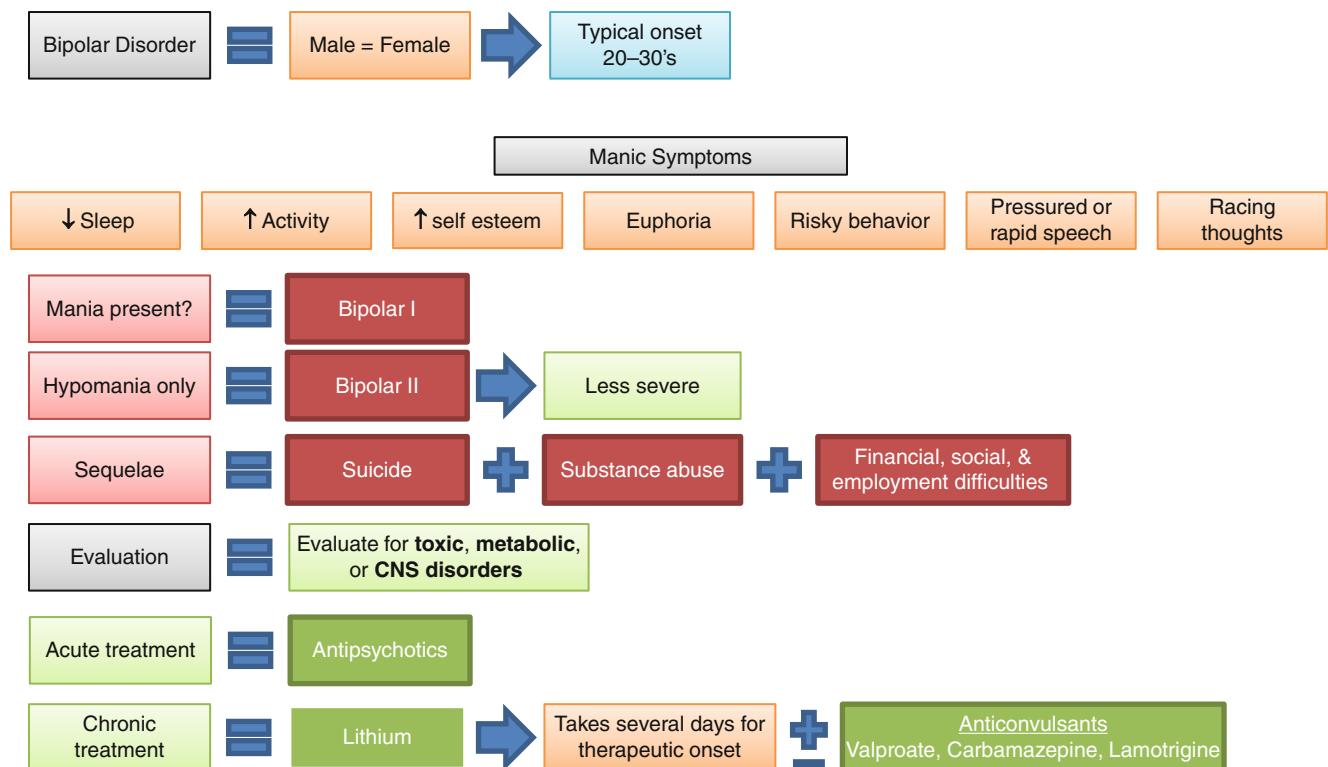
Suicide



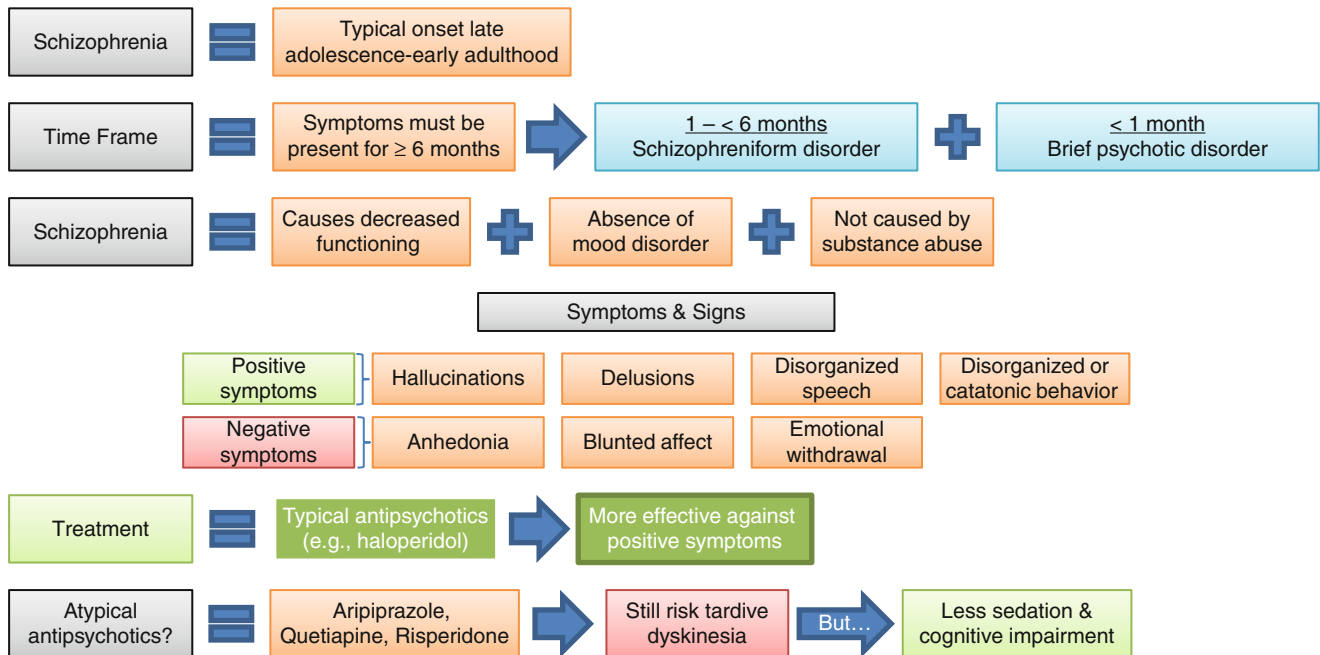
Grief Reaction



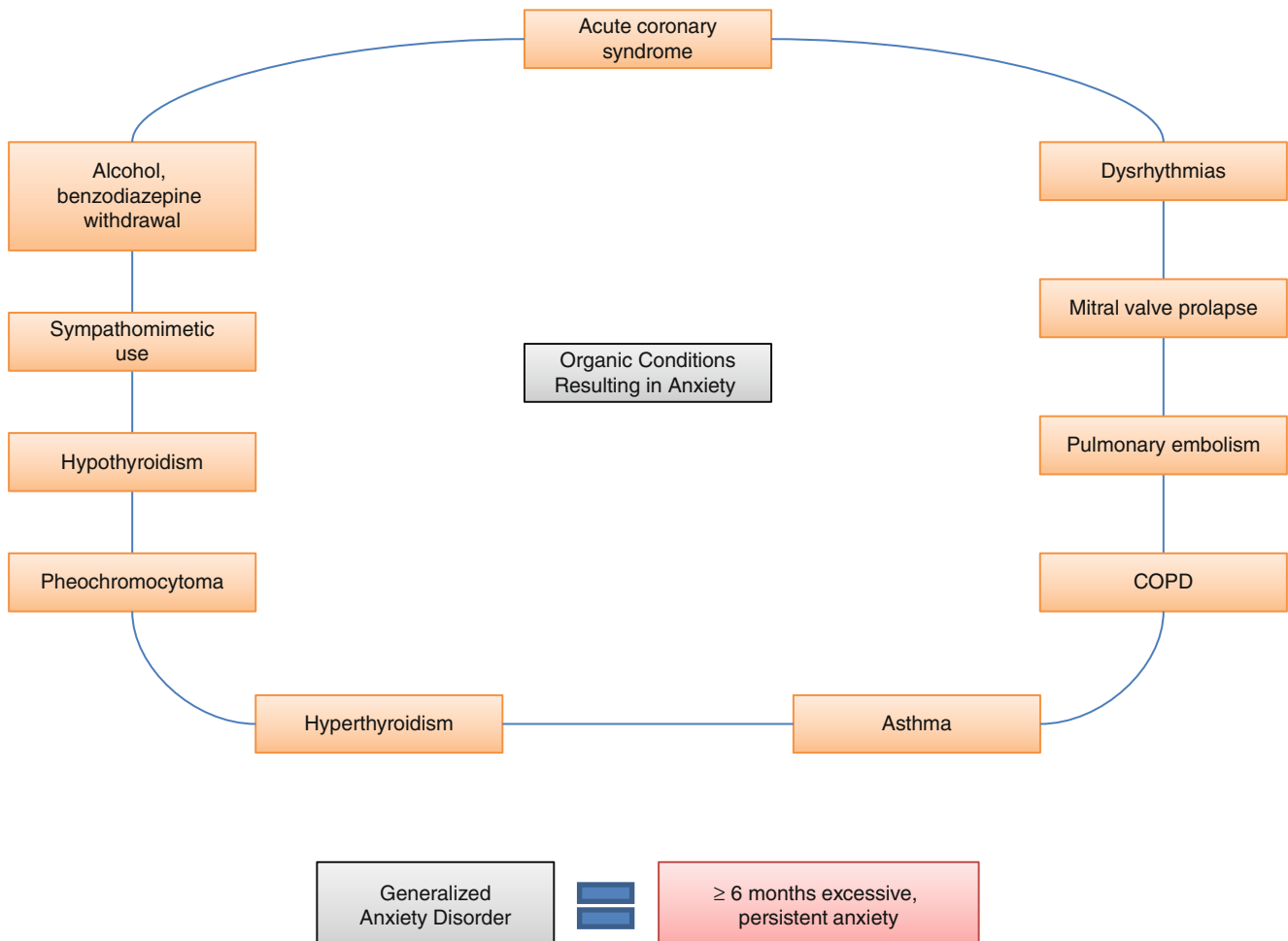
Bipolar Disorder



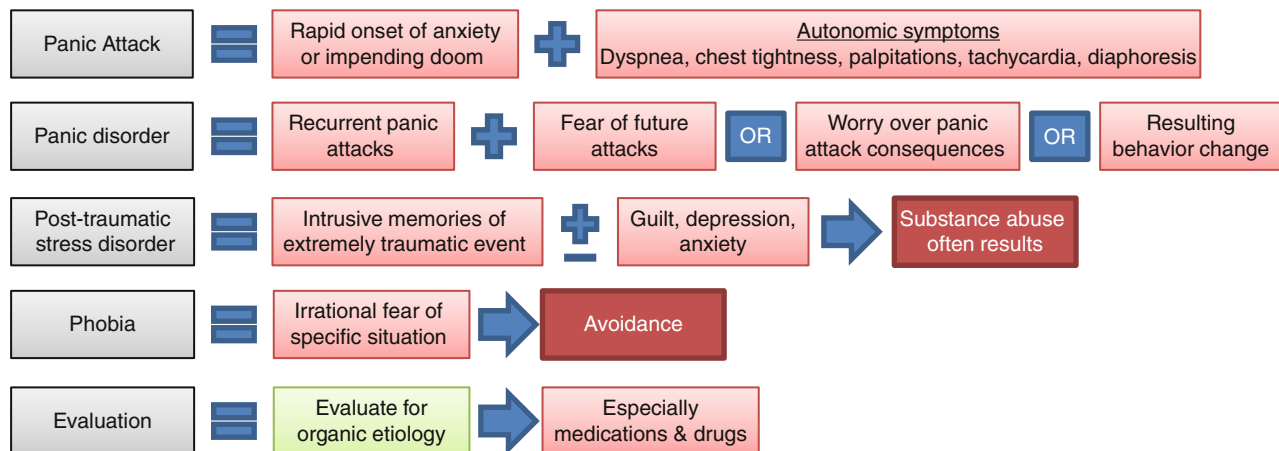
Schizophrenia



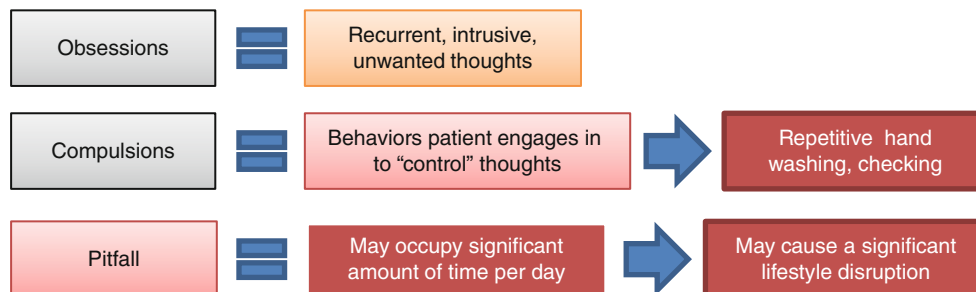
Anxiety



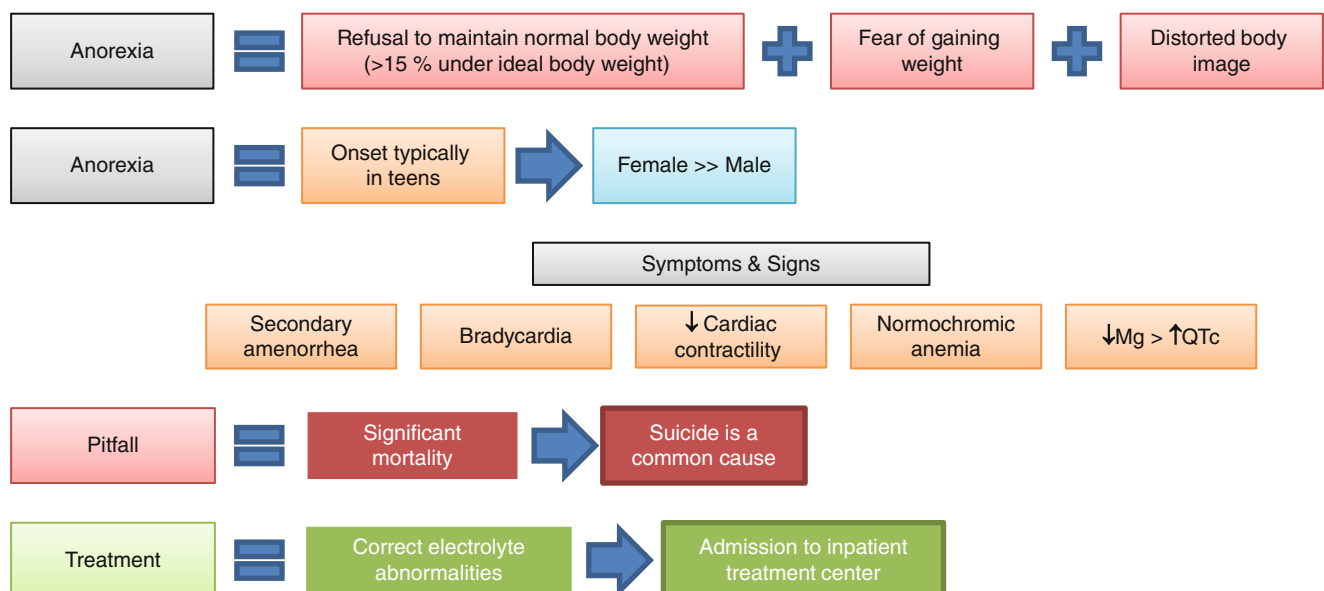
Anxiety Disorders



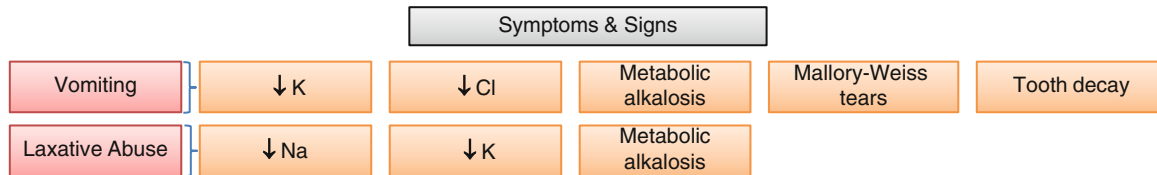
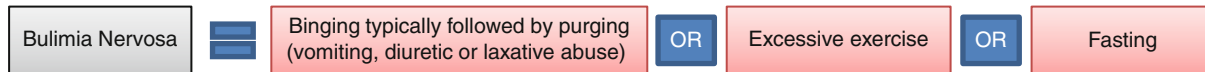
Obsessive-Compulsive Disorder



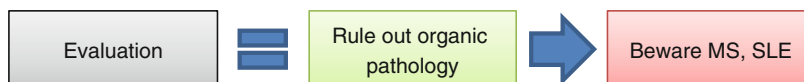
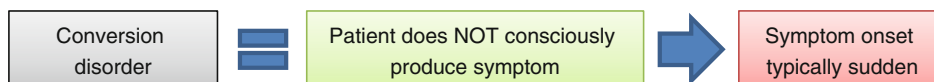
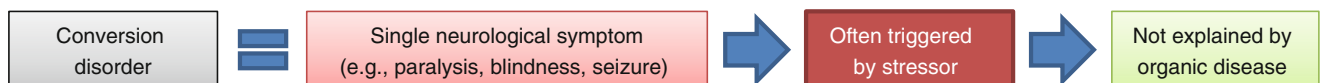
Anorexia



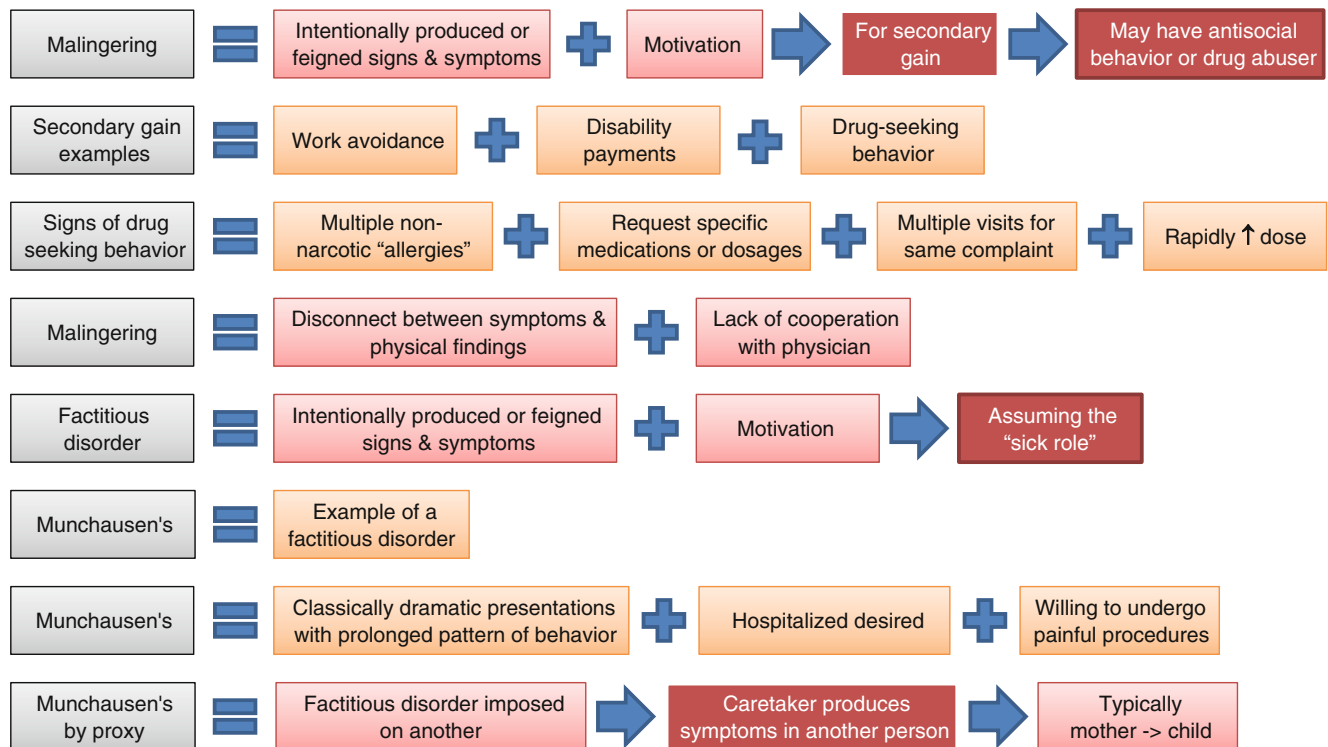
Bulimia Nervosa



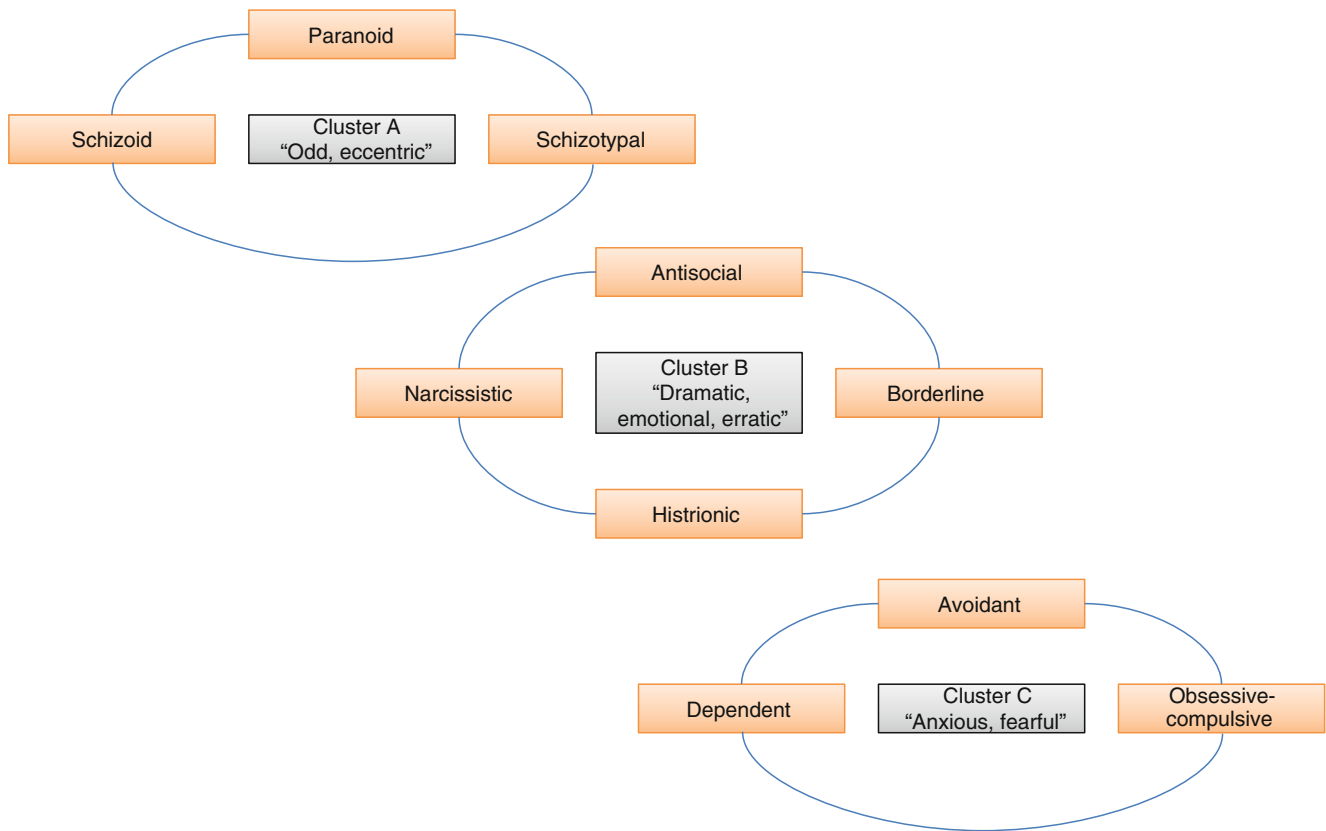
Somatoform Disorders



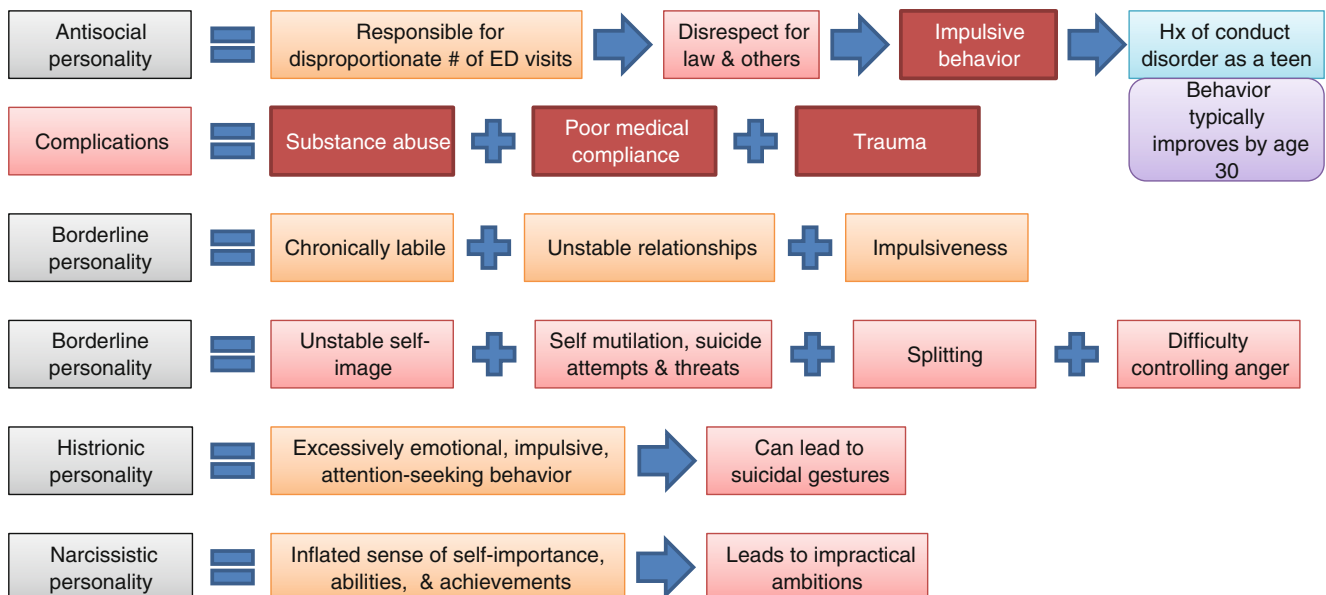
Malingering, Factitious Disorders, and Munchausen's Syndrome



Personality Disorders

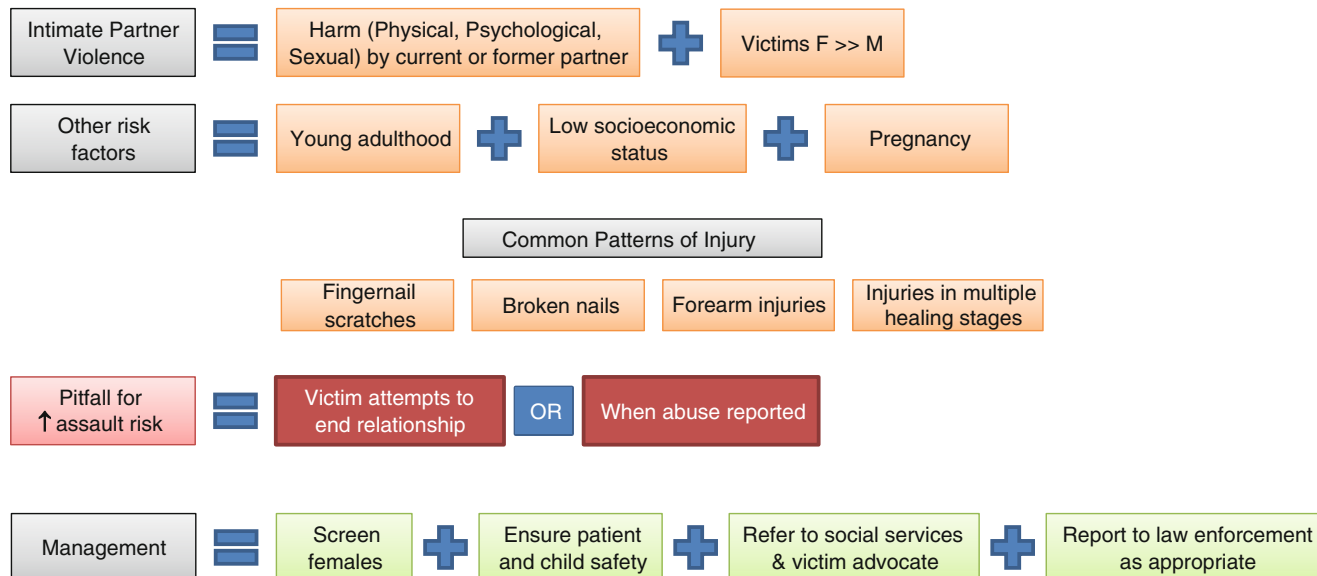


Antisocial, Borderline, Histrionic, and Narcissistic Personality Disorders

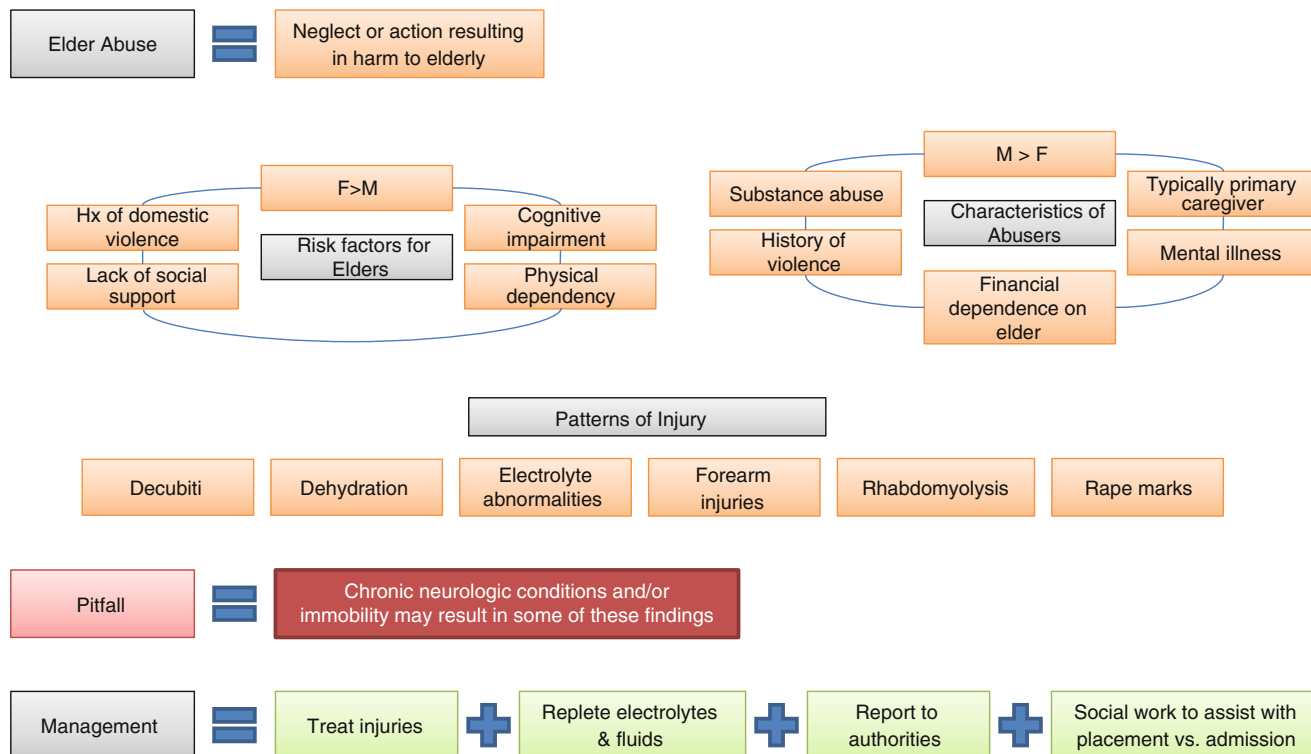


Abuse/Neglect/Violence

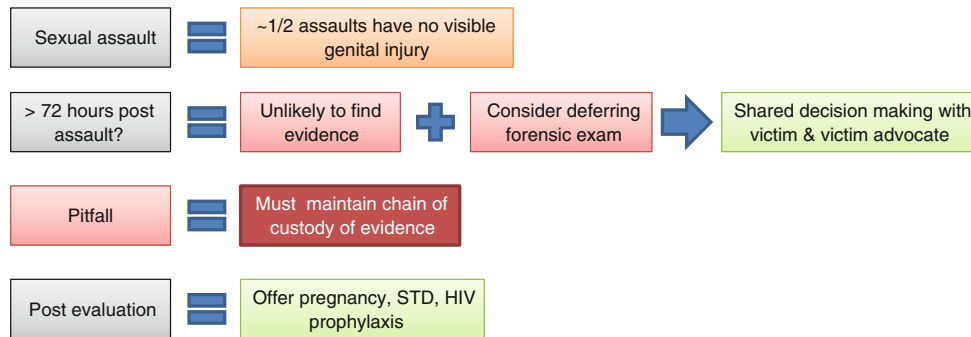
Intimate Partner Violence



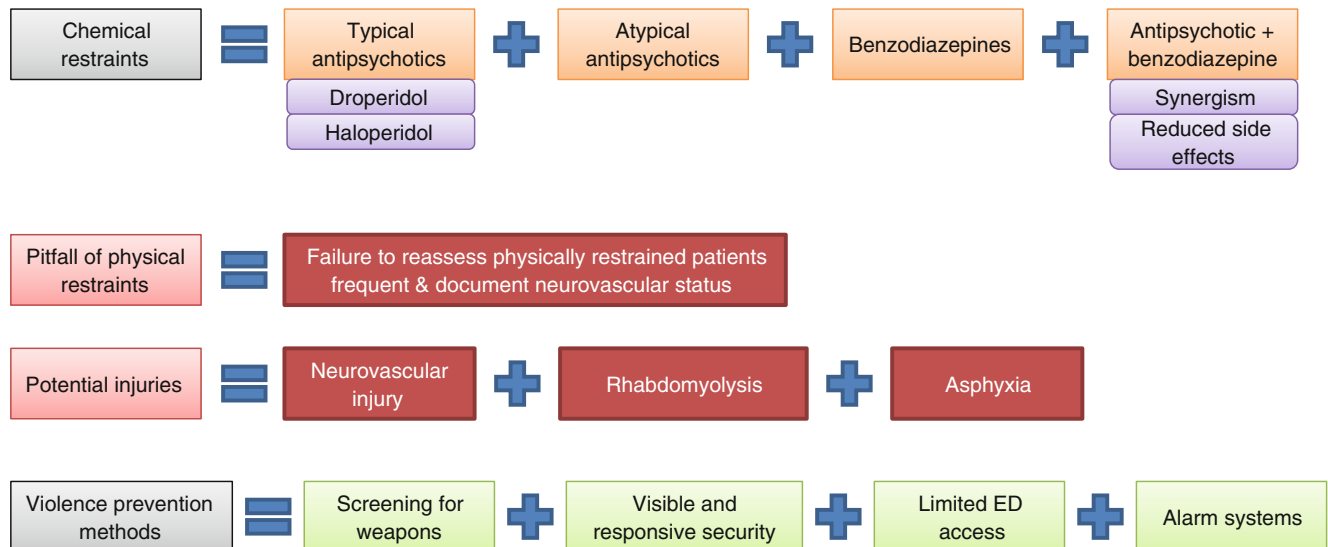
Elder Abuse



Sexual Assault

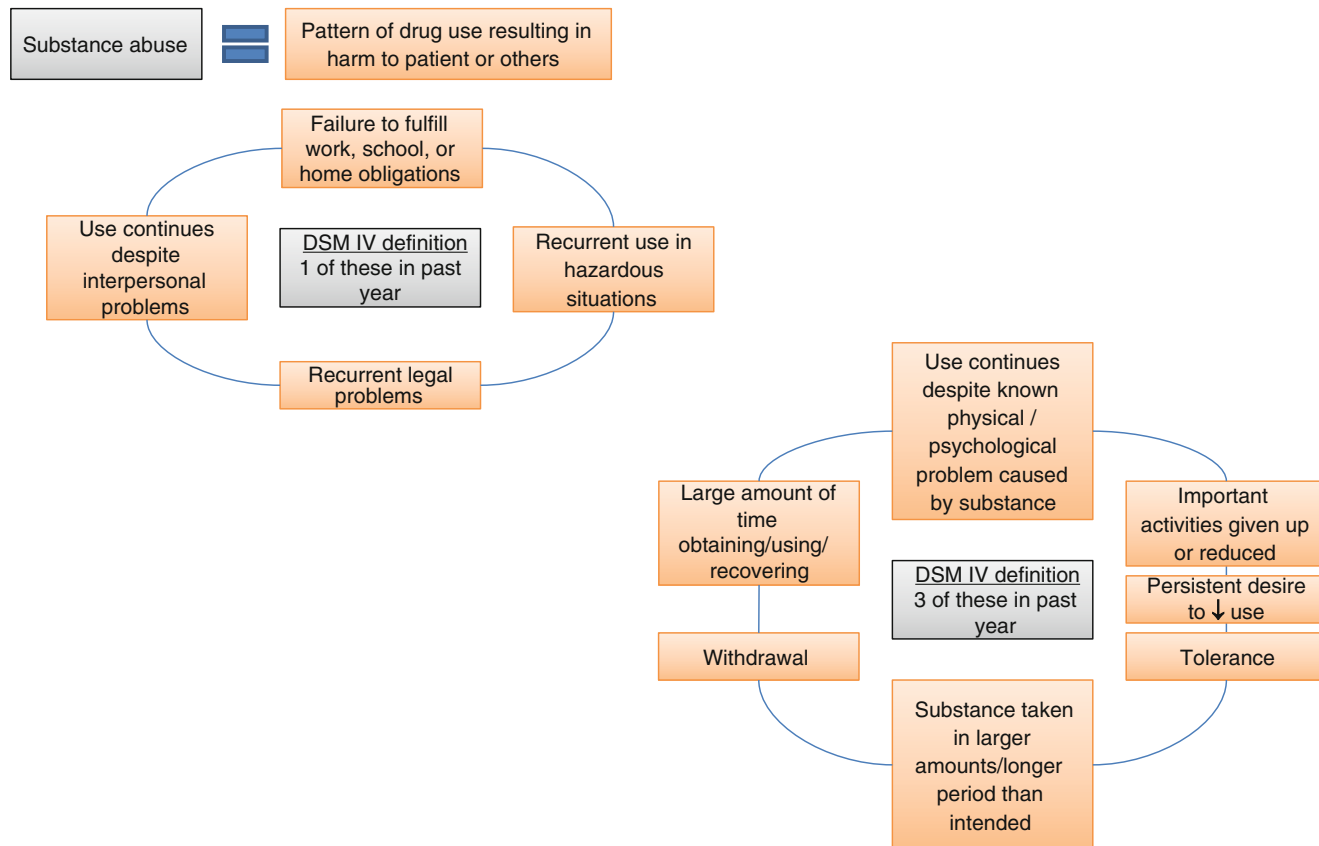


ED Staff/Patient Safety

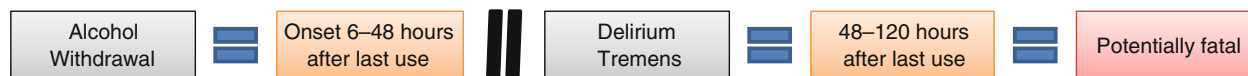


Addictive Behavior and Withdrawal

Substance Abuse/Dependence



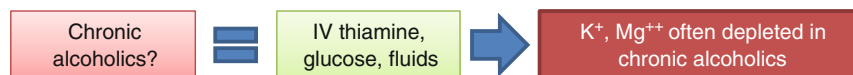
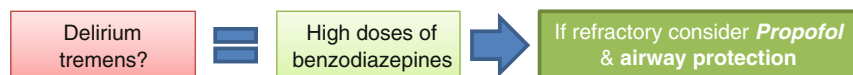
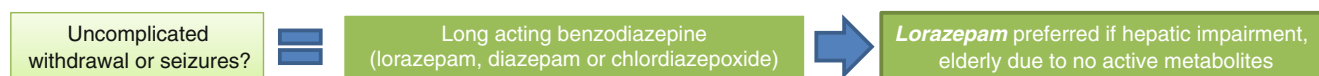
Alcohol Withdrawal



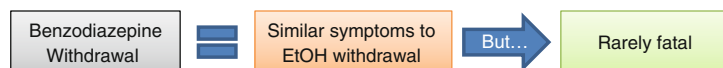
Symptoms & Signs Withdrawal



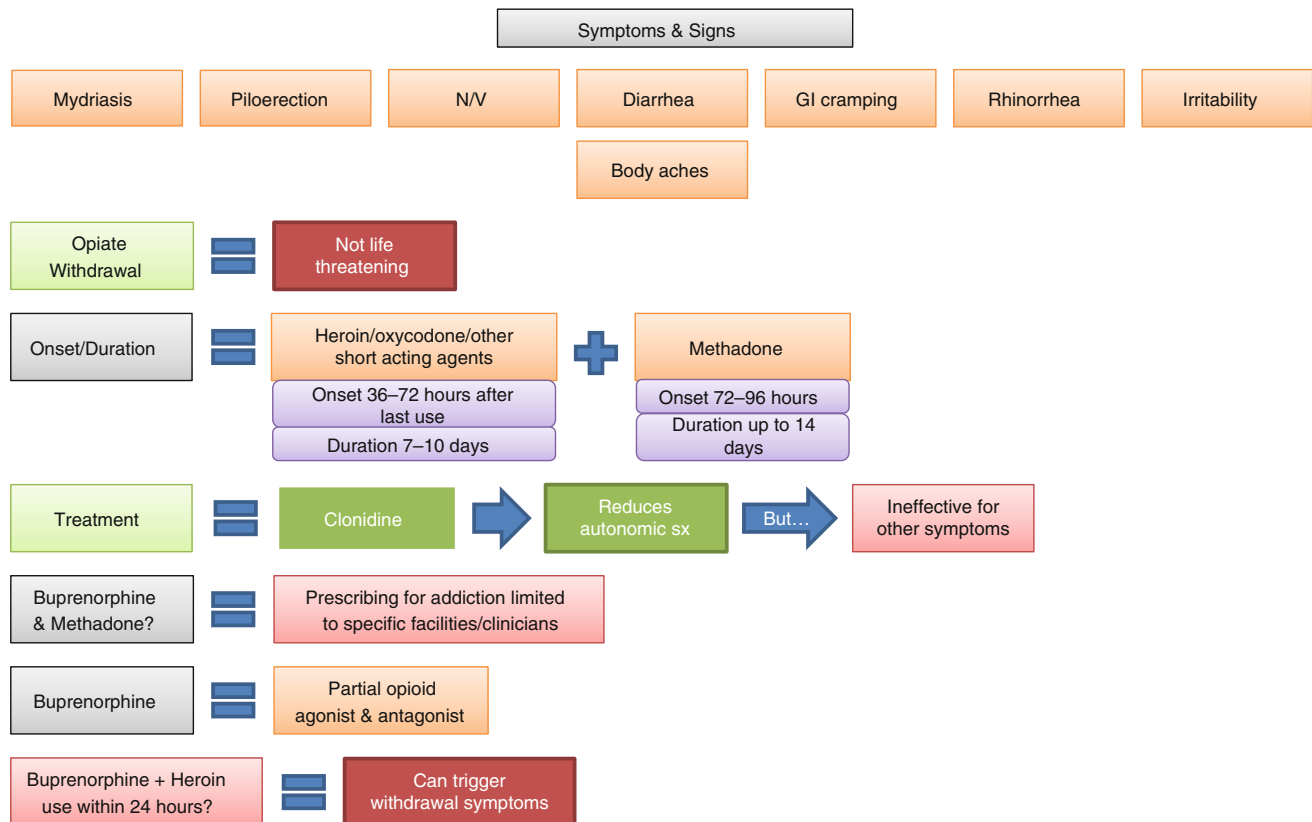
Symptoms & Signs Delirium Tremens



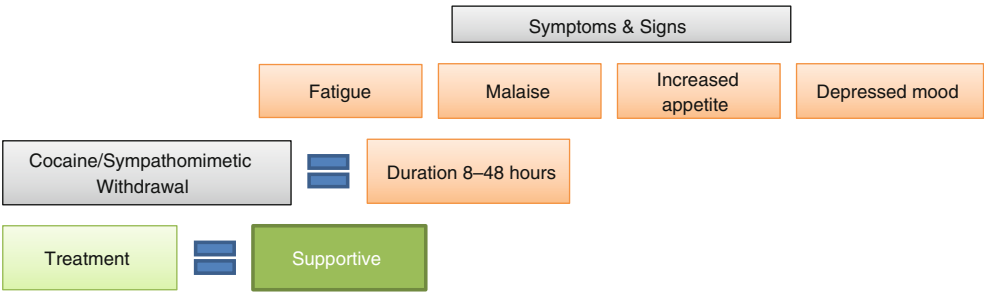
Benzodiazepine Withdrawal



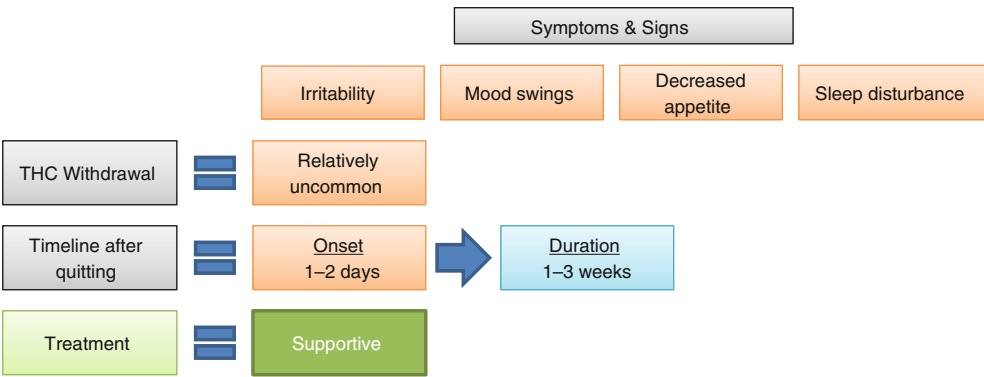
Opiate Withdrawal



Cocaine/Sympathomimetic Withdrawal



THC Withdrawal



Obstetrics and Gynecology

Bobby Desai and Alpa Desai

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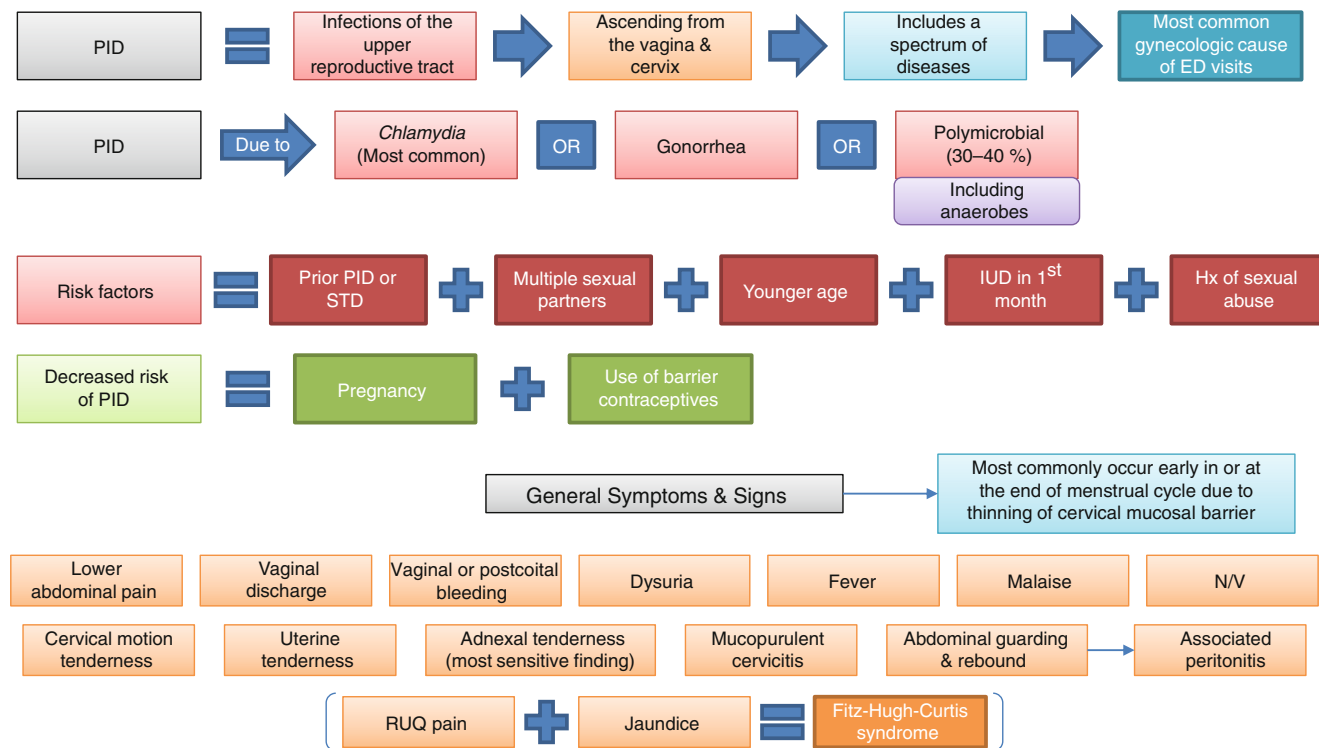
B. Desai, MD, MEd (✉)
Department of Emergency Medicine, University of Florida,
Gainesville, FL, USA
e-mail: bdesai@ufl.edu

A. Desai, DO
Community Health and Family Medicine,
University of Florida College of Medicine, Gainesville, FL, USA

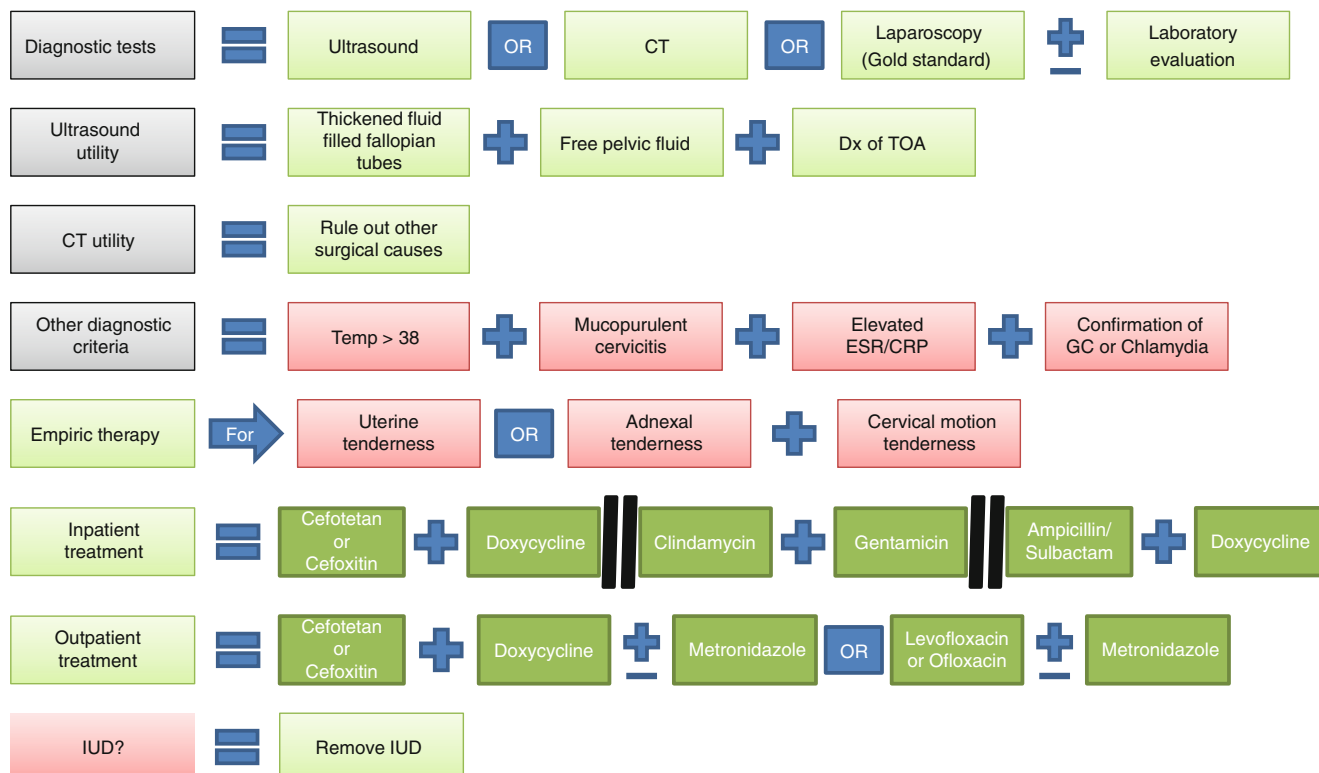
Infections

Pelvic Inflammatory Disease

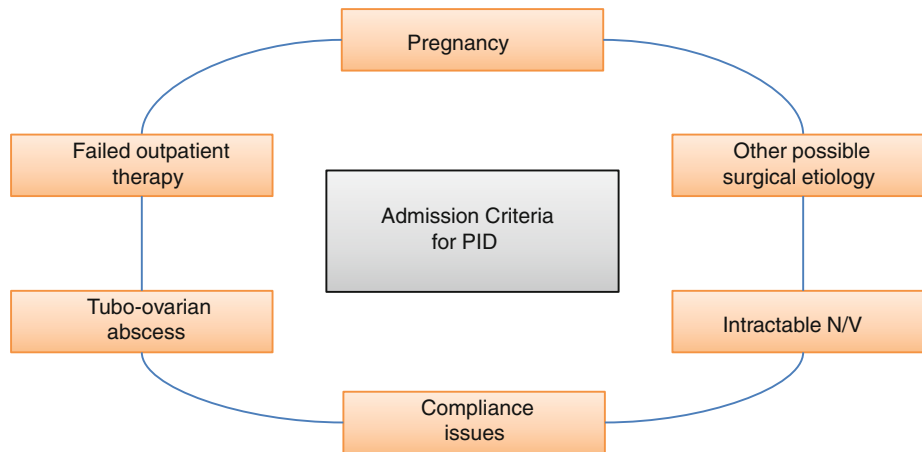
Introduction



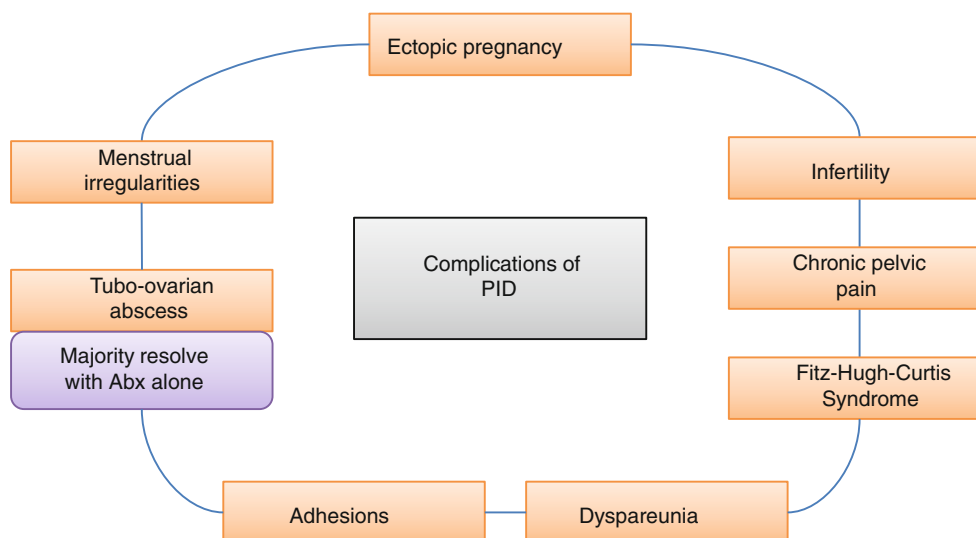
Diagnosis and Treatment



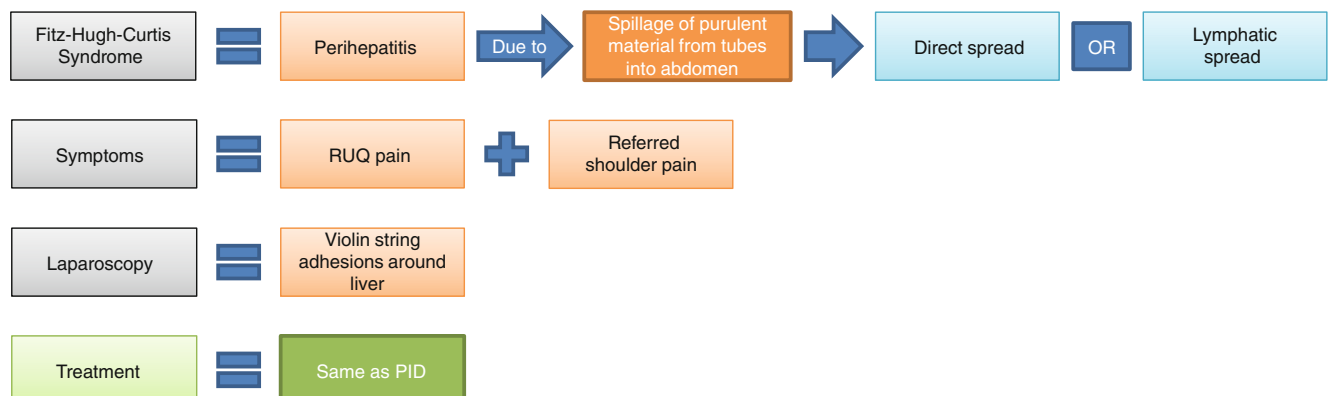
Admission Criteria for PID



Complications of PID

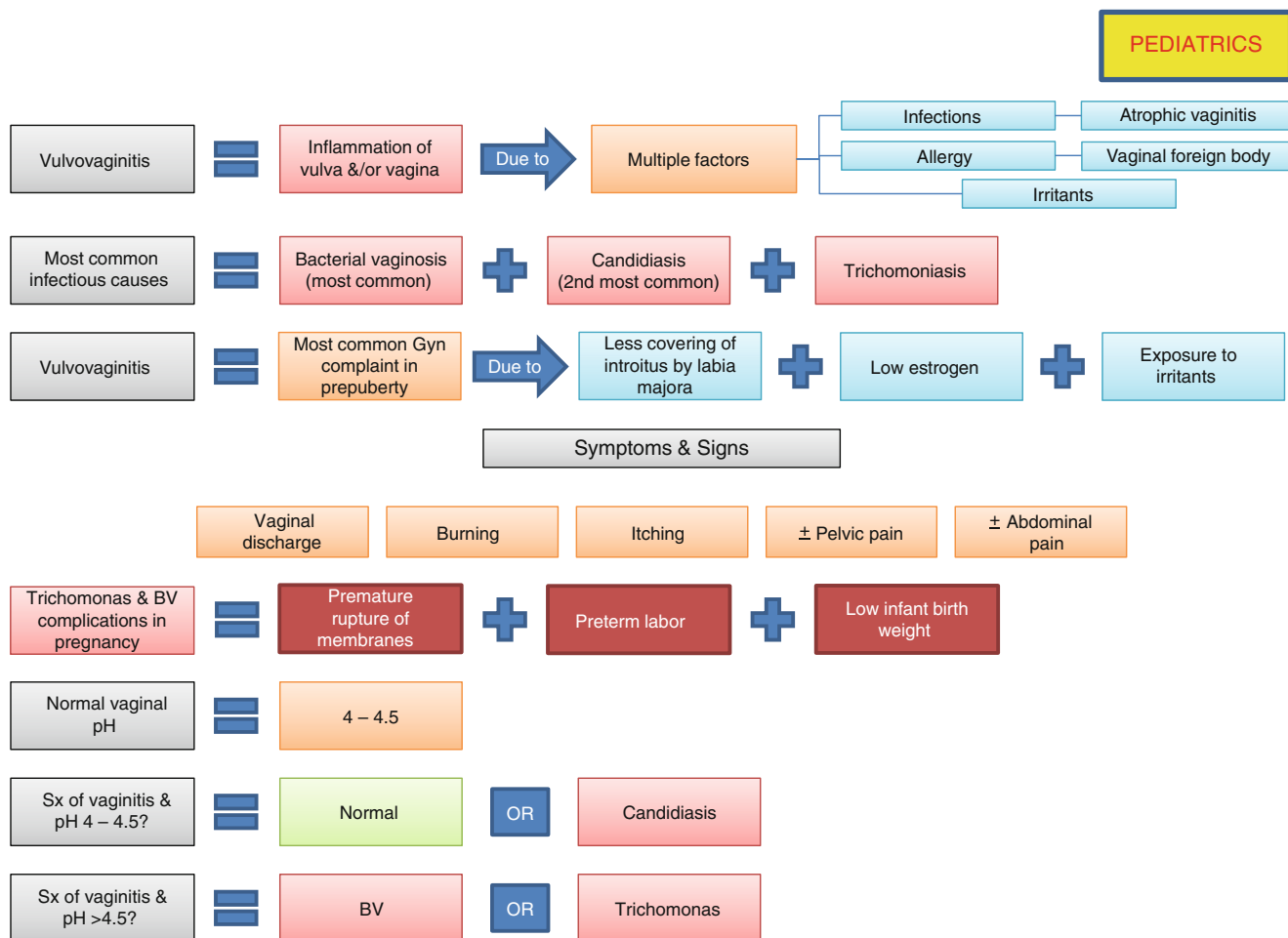


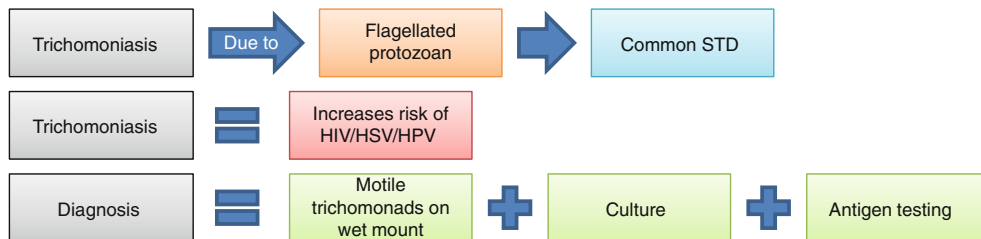
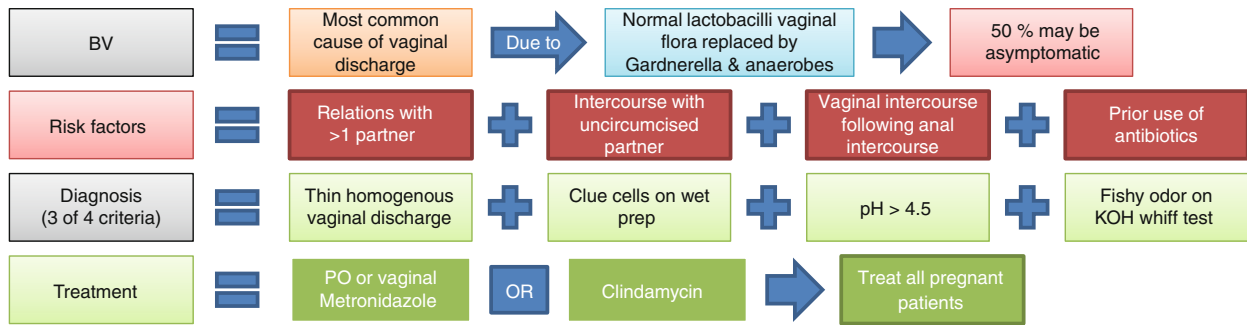
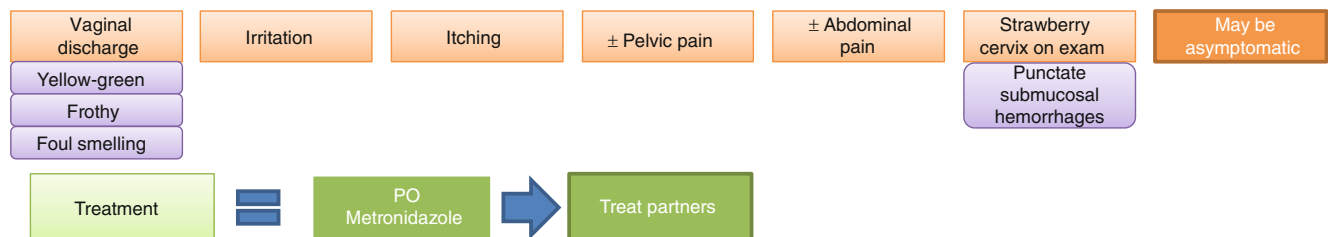
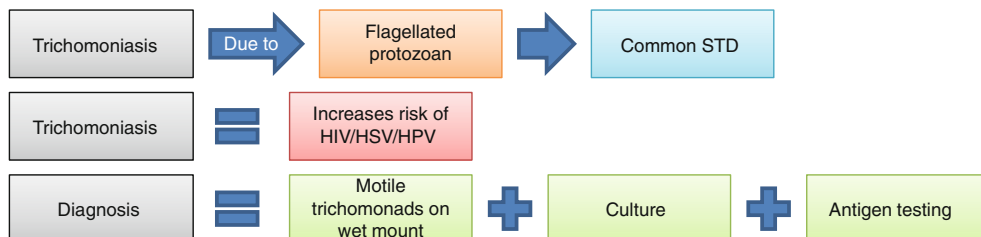
Fitz-Hugh-Curtis Syndrome



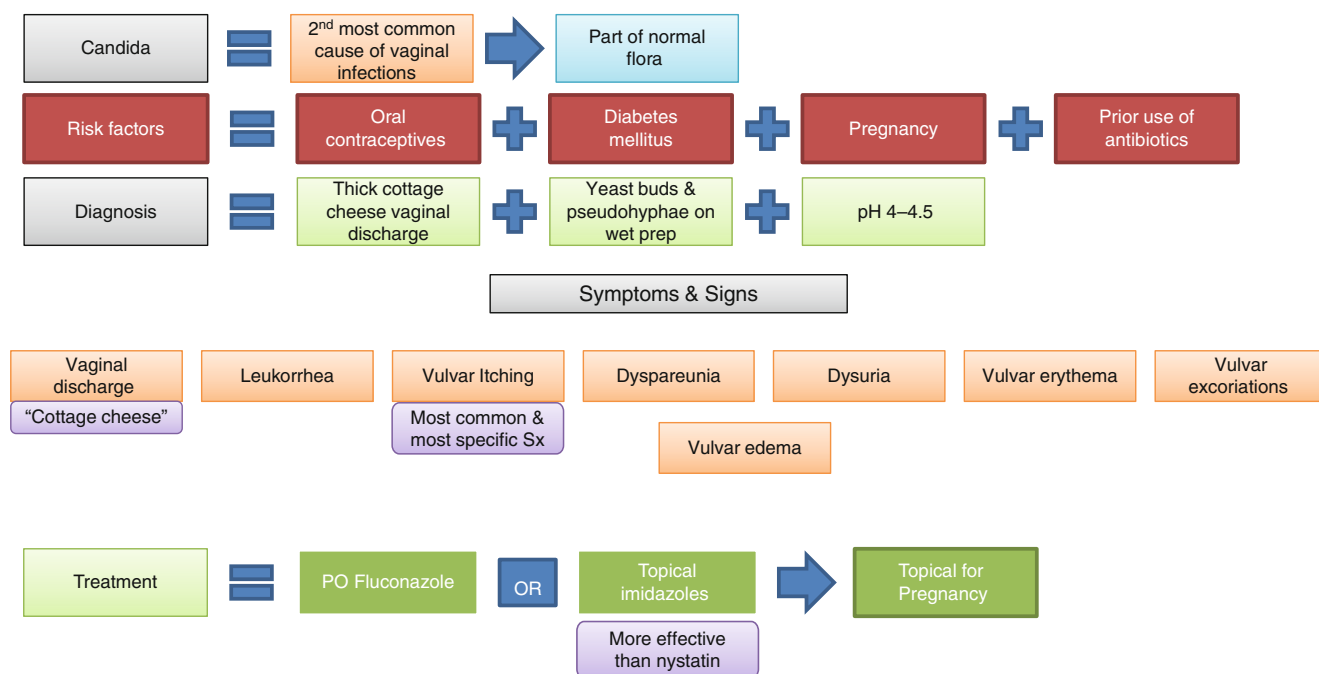
Vulvovaginitis

Introduction

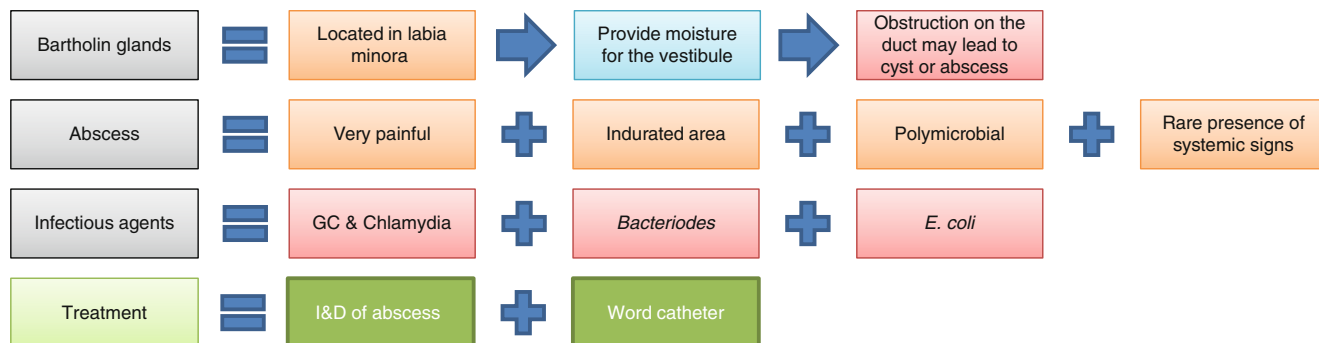


Bacterial Vaginosis (BV)**Symptoms & Signs****Trichomoniasis****Symptoms & Signs**

Candida Vaginitis

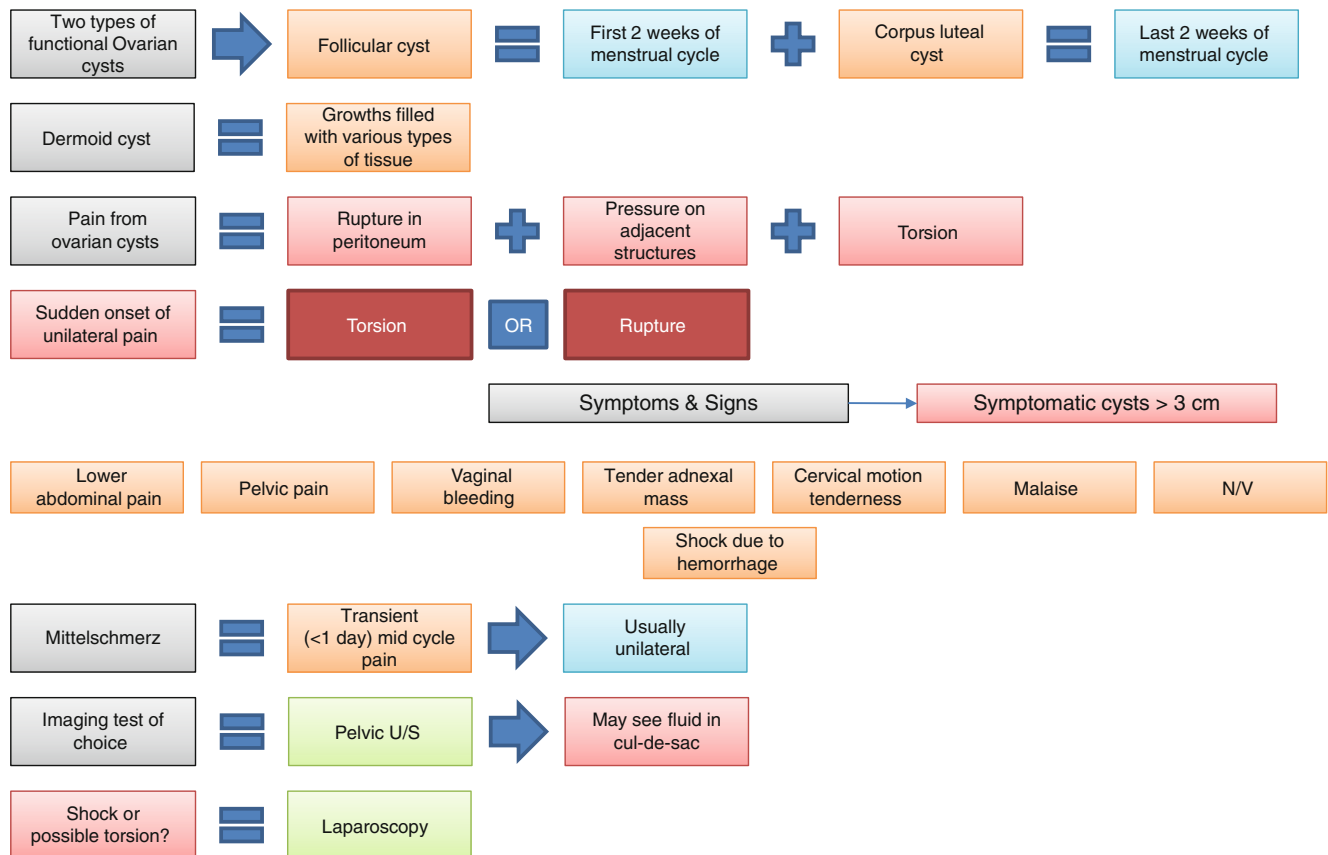


Bartholin Cyst and Abscess



Abdominal and Pelvic Pain in the Nonpregnant Patient

Ovarian Cysts



Ovarian or Adnexal Torsion



Symptoms & Signs

Unilateral constant lower abdominal pain

N/V

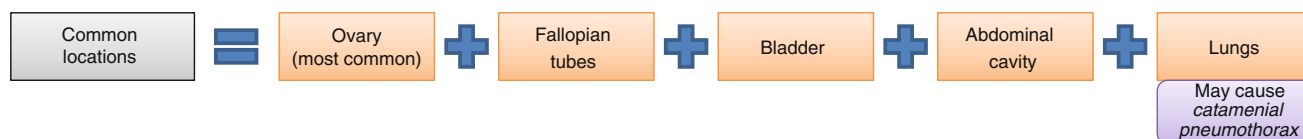
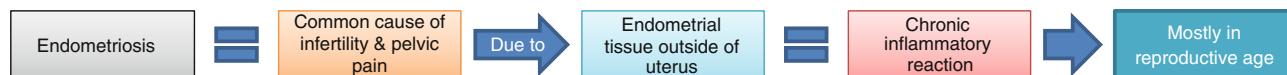
Vaginal bleeding is *not common*

Tender adnexal mass

Cervical motion tenderness



Endometriosis



Symptoms & Signs

Chronic lower abdominal pain

Pain is cyclical, associated with menses

Dysmenorrhea (most common symptom)

Dyspareunia

Hypermenorrhea

Pelvic pain

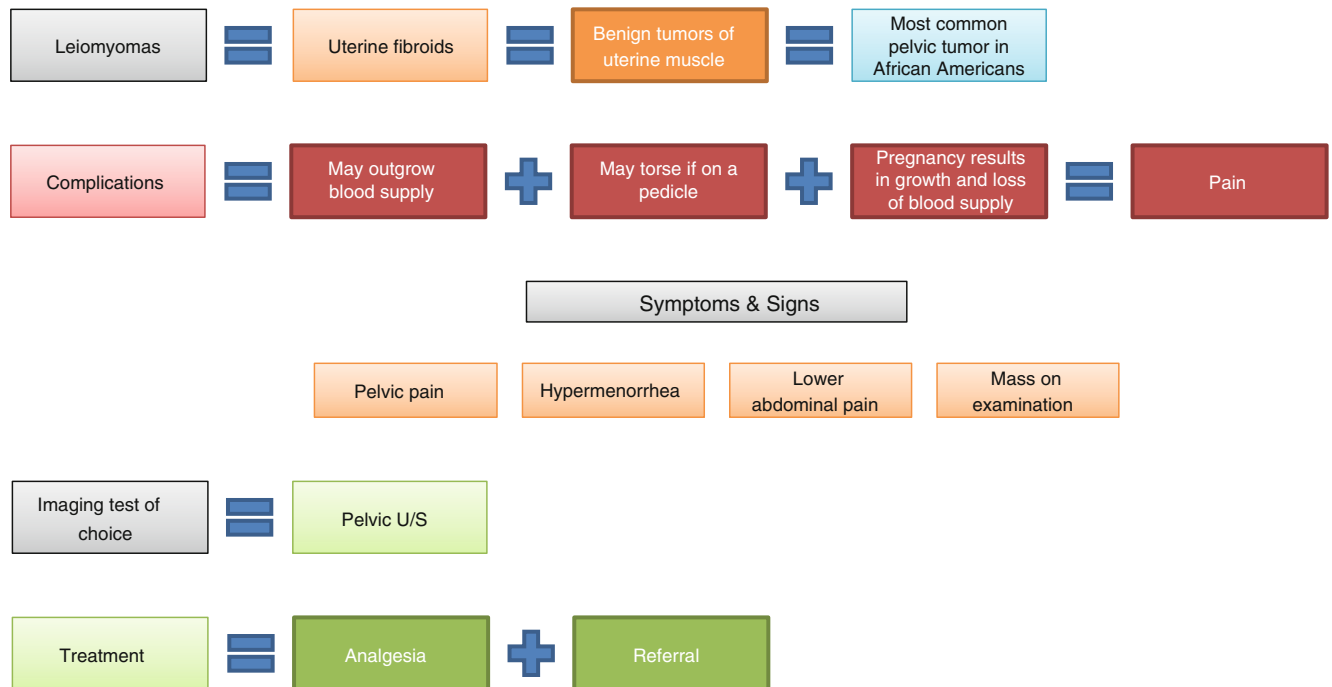
Enlarged adherent uterus

Ovarian mass (Chocolate cyst)

Infertility

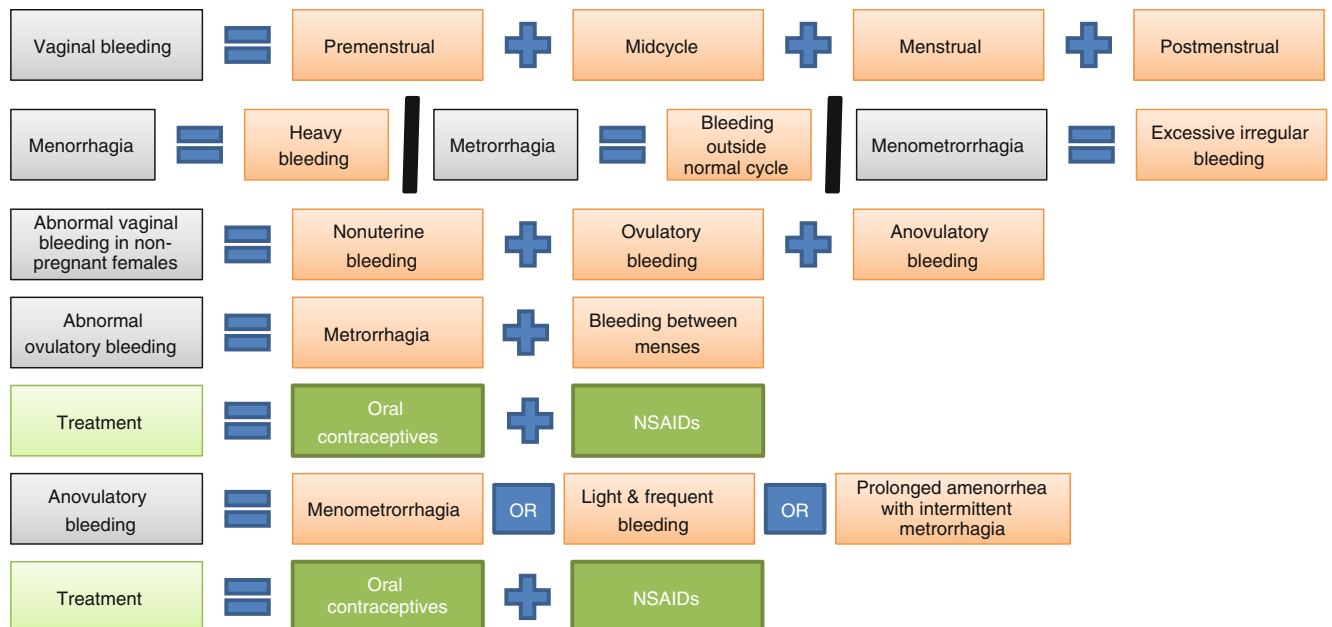


Leiomyomas



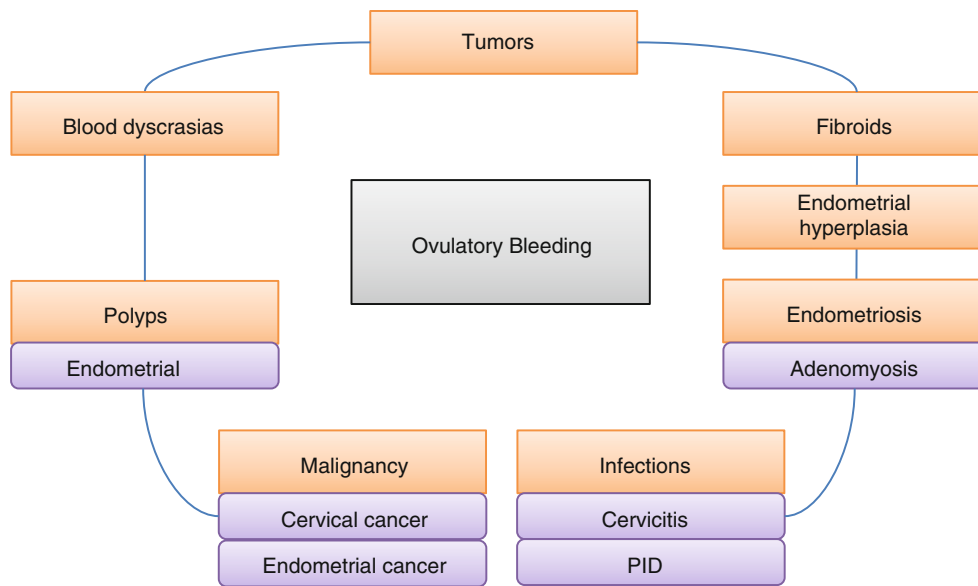
Abnormal Vaginal Bleeding

Abnormal Vaginal Bleeding

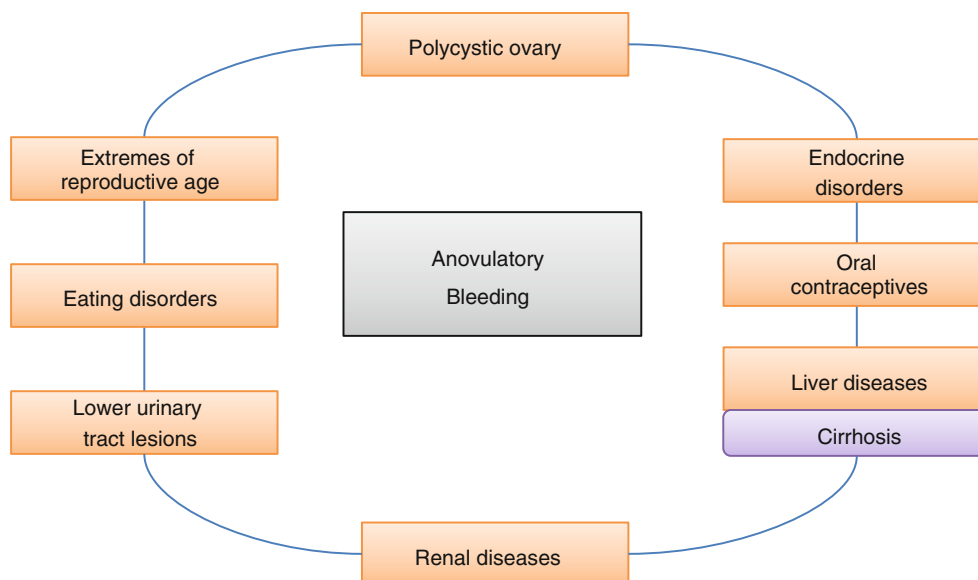


Consider endometrial cancer in pts > 35!

Ovulatory Bleeding

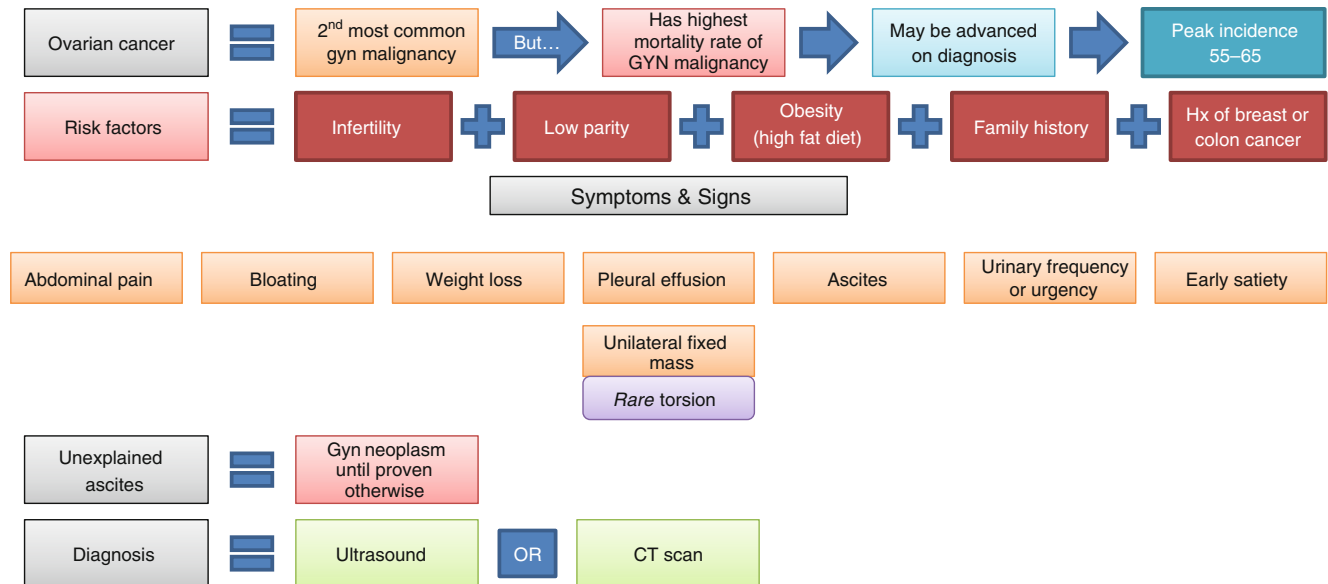


Anovulatory Bleeding

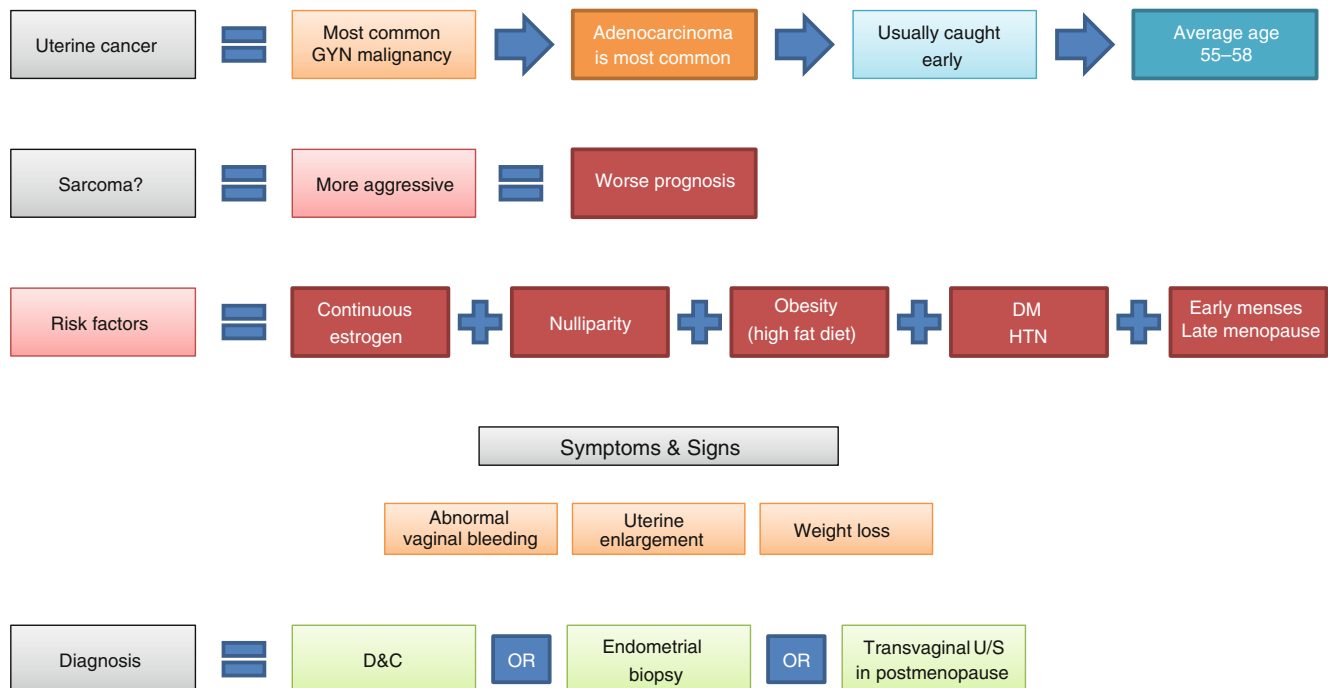


Gynecologic Oncology

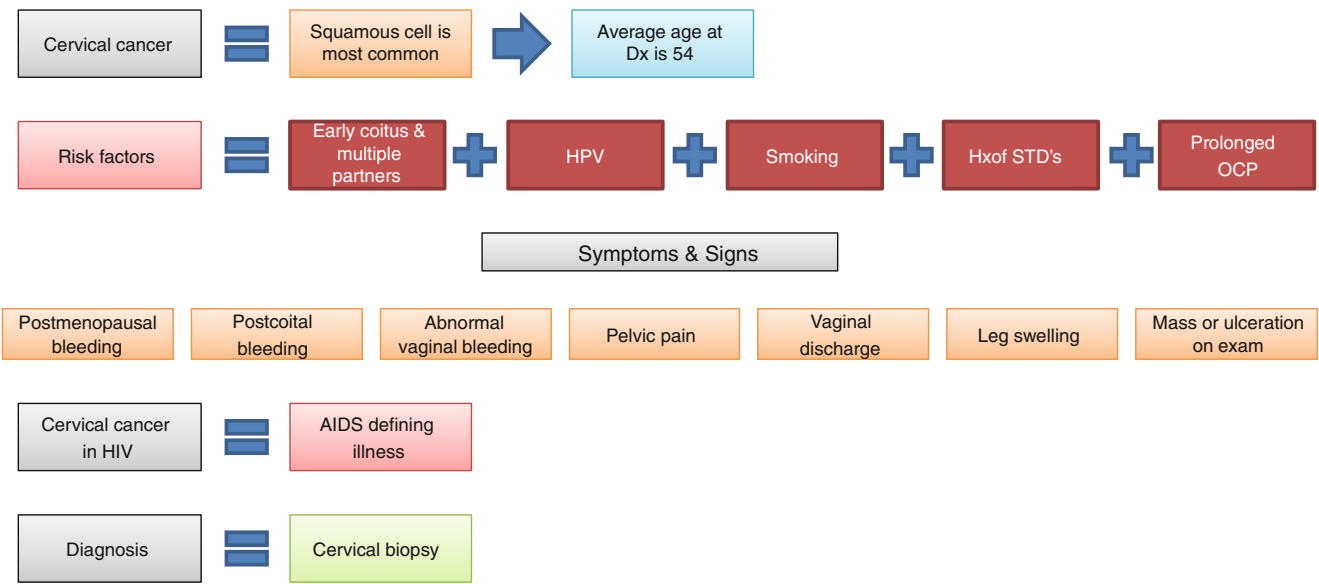
Ovarian Cancer



Uterine Cancer

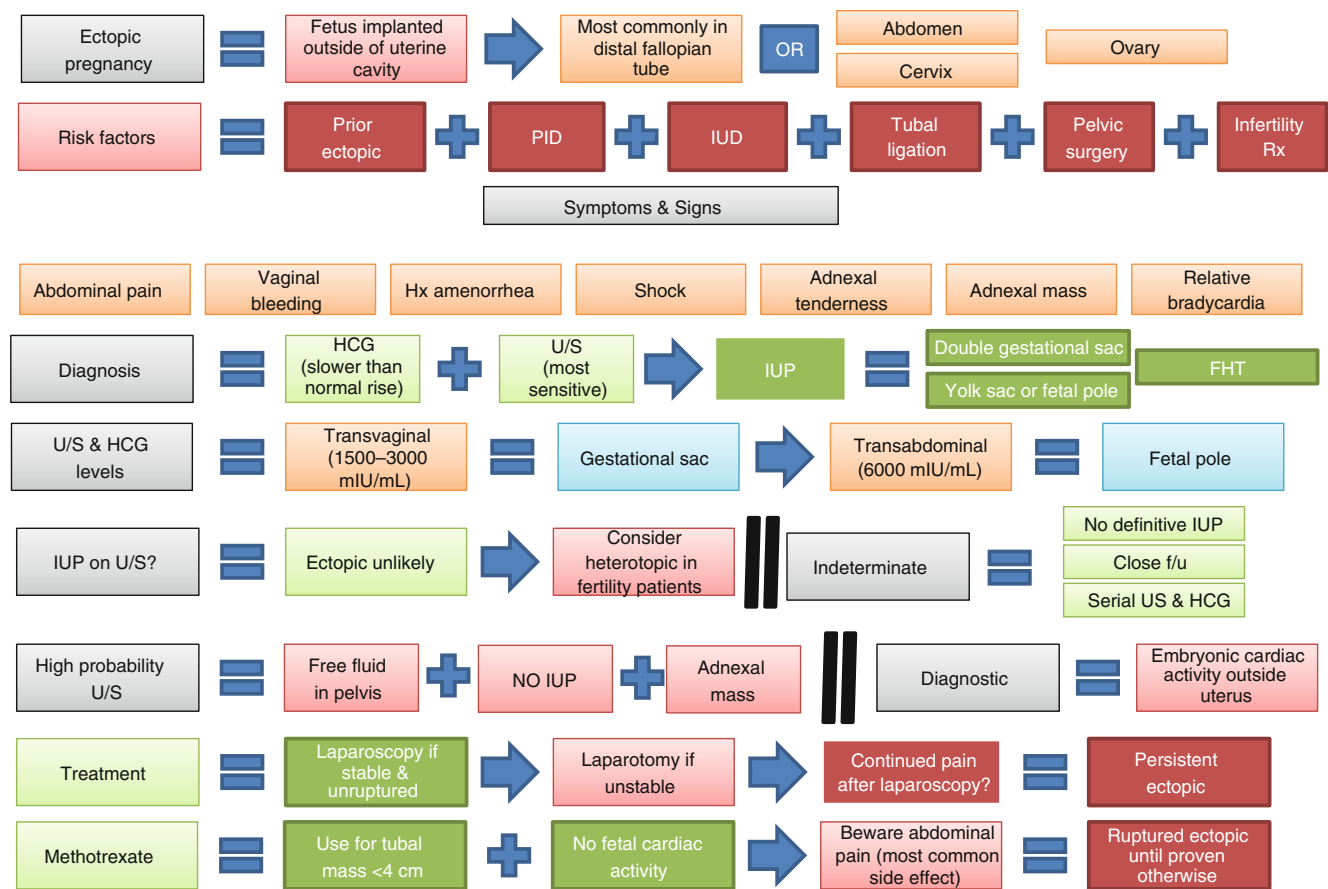


Cervical Cancer

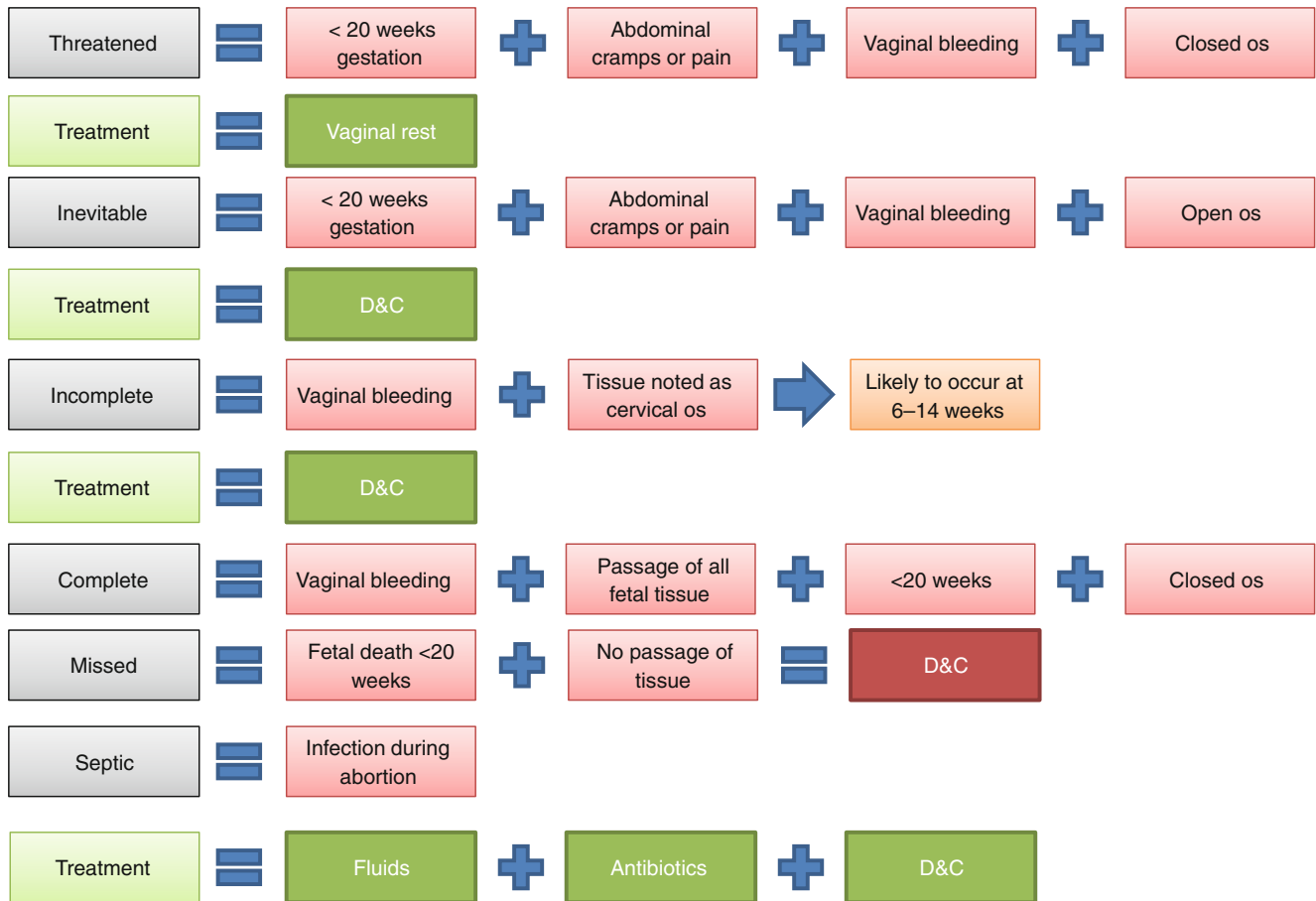


Obstetrics

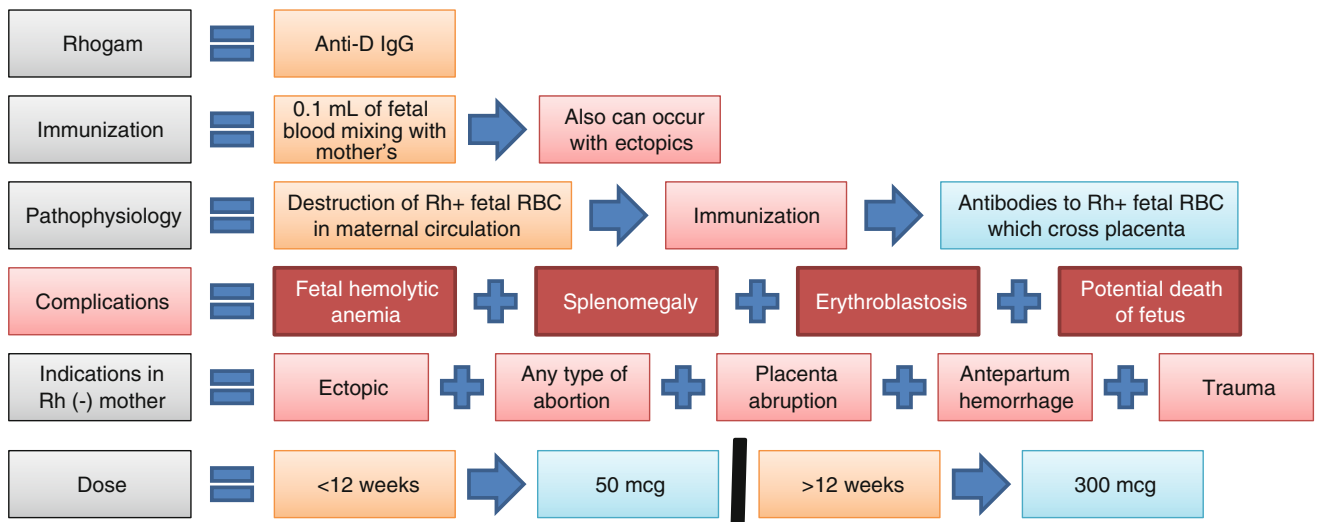
Ectopic Pregnancy



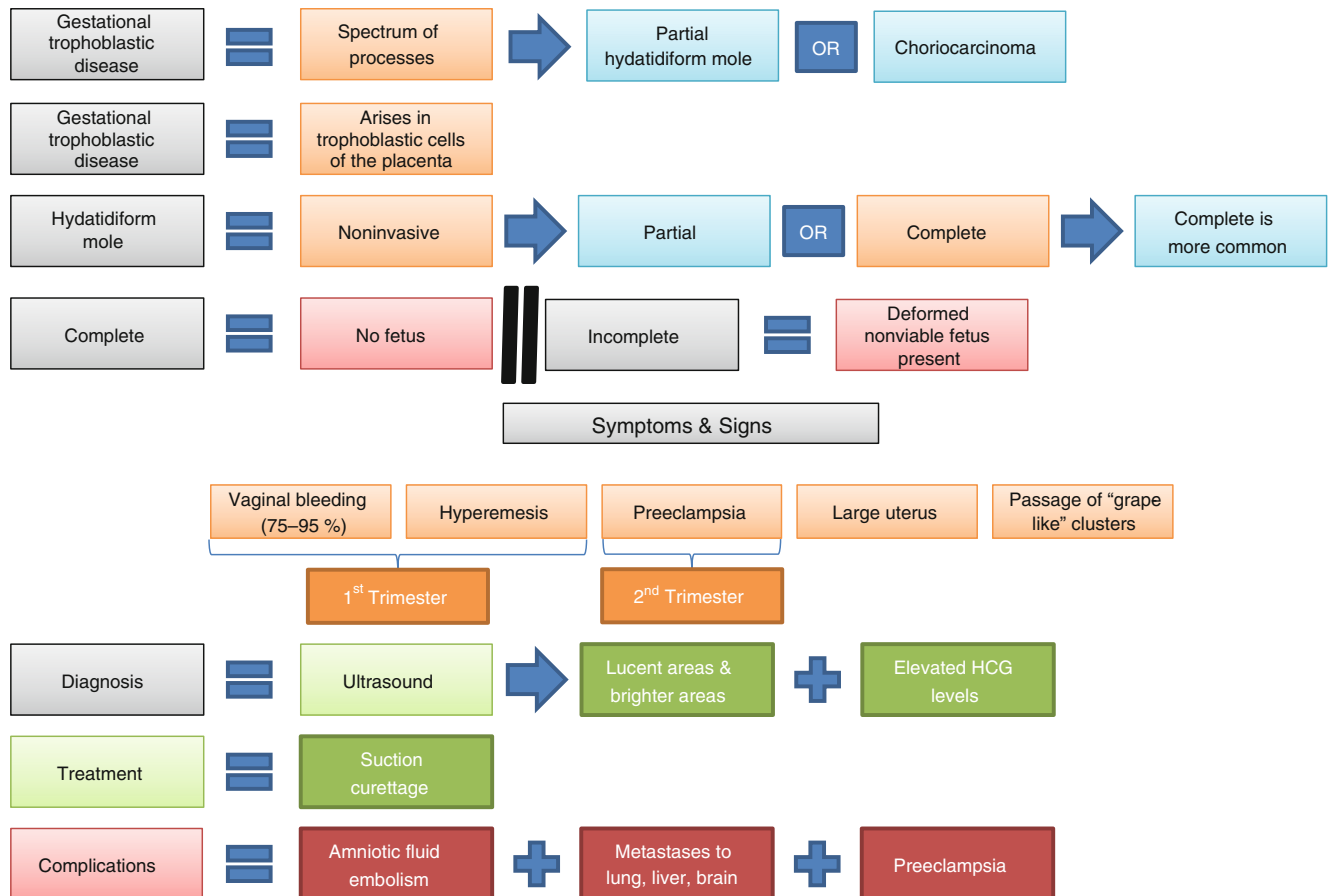
Abortions



RhoGAM

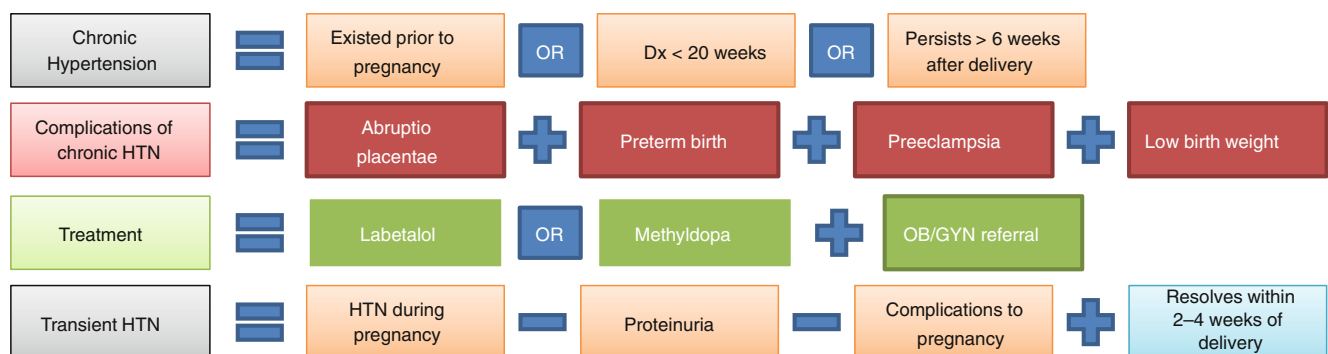


Gestational Trophoblastic Disease

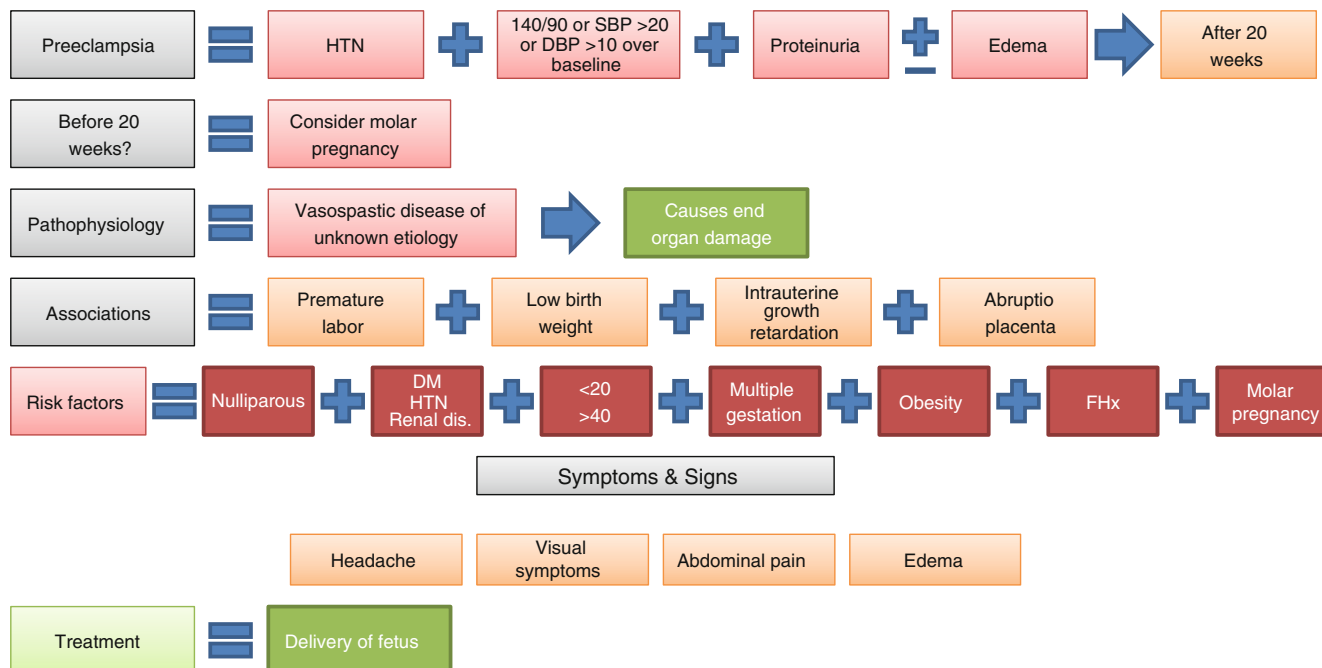


Hypertension, Preeclampsia, and Eclampsia

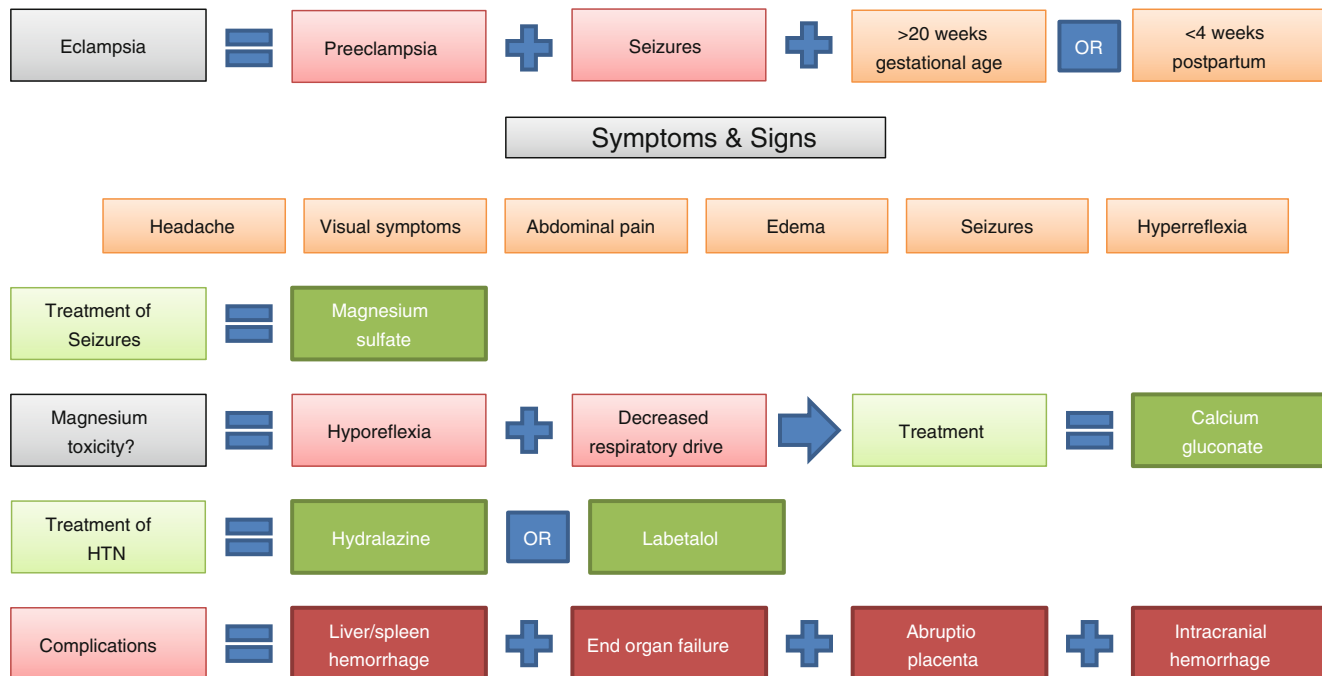
Hypertension in Pregnancy



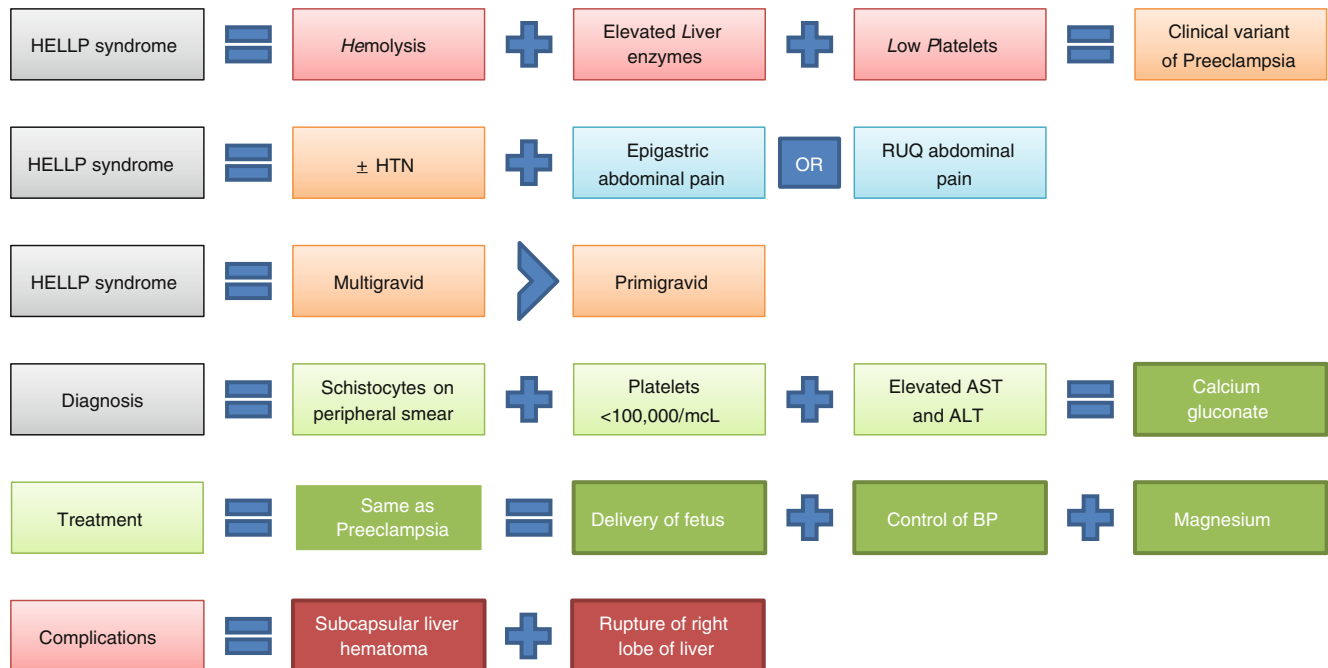
Preeclampsia



Eclampsia

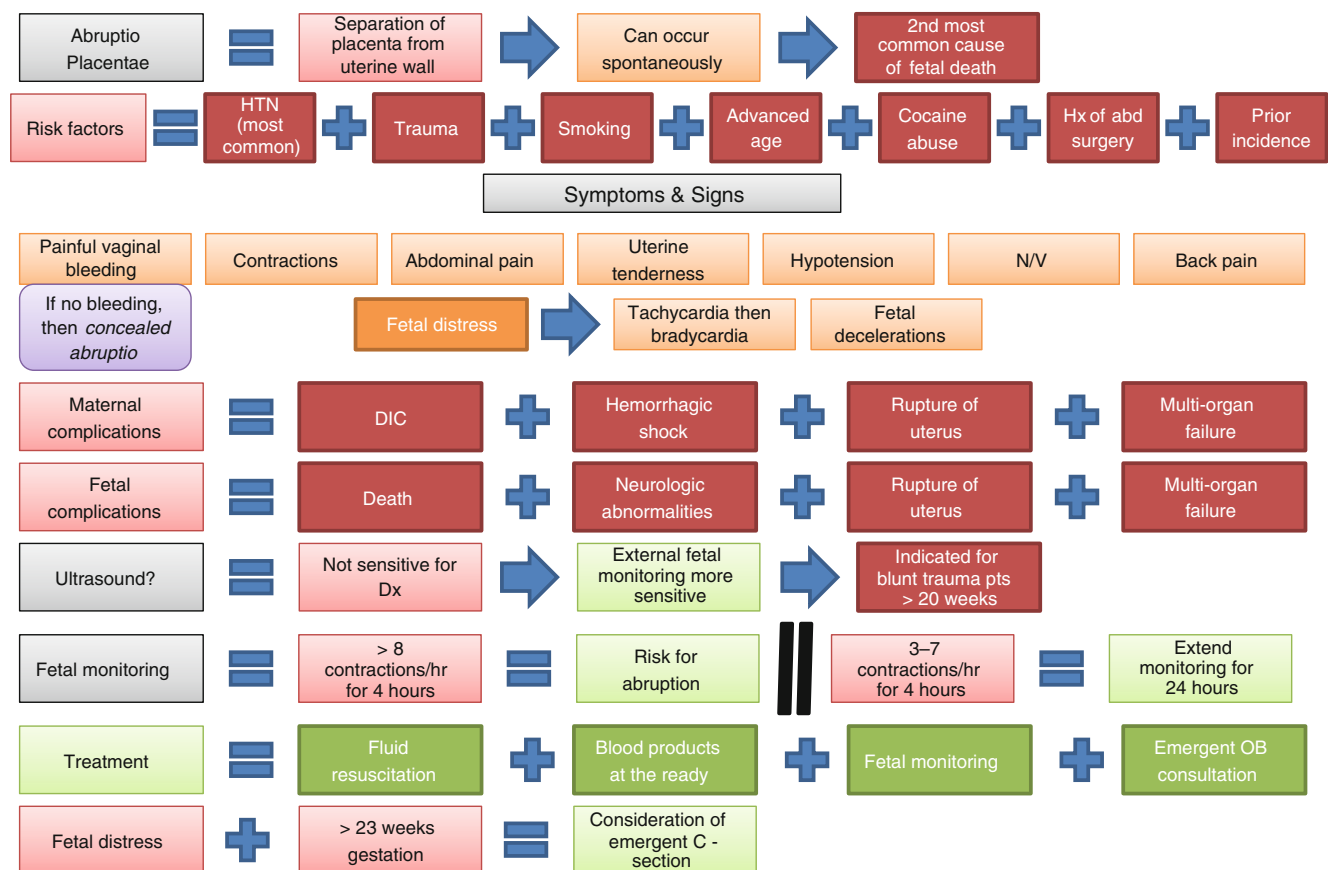


HELLP Syndrome

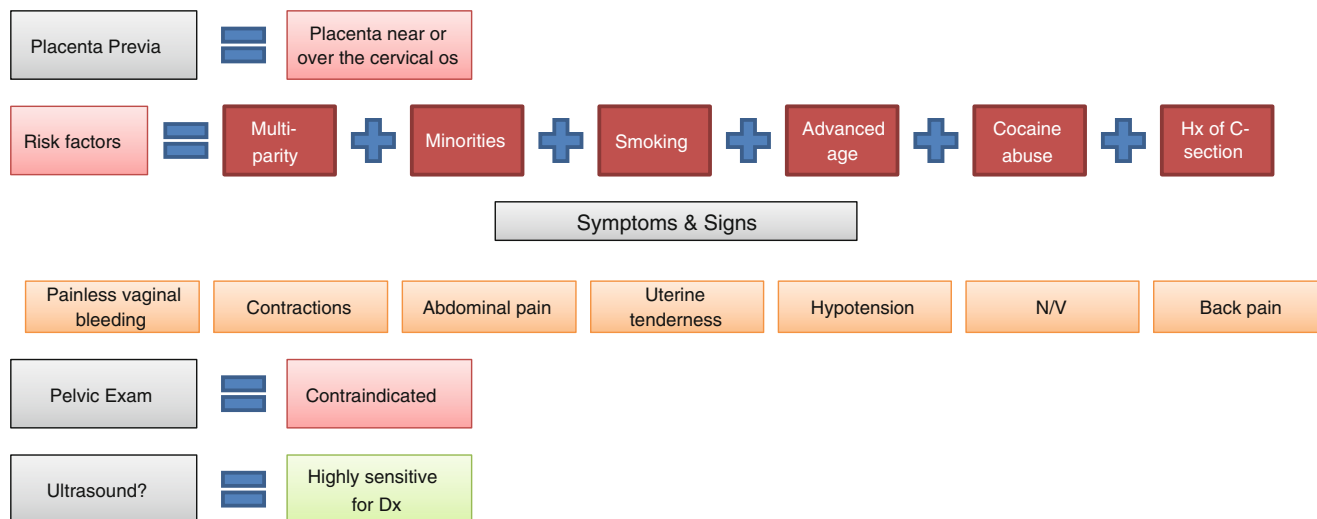


Placental Emergencies

Abruptio Placentae

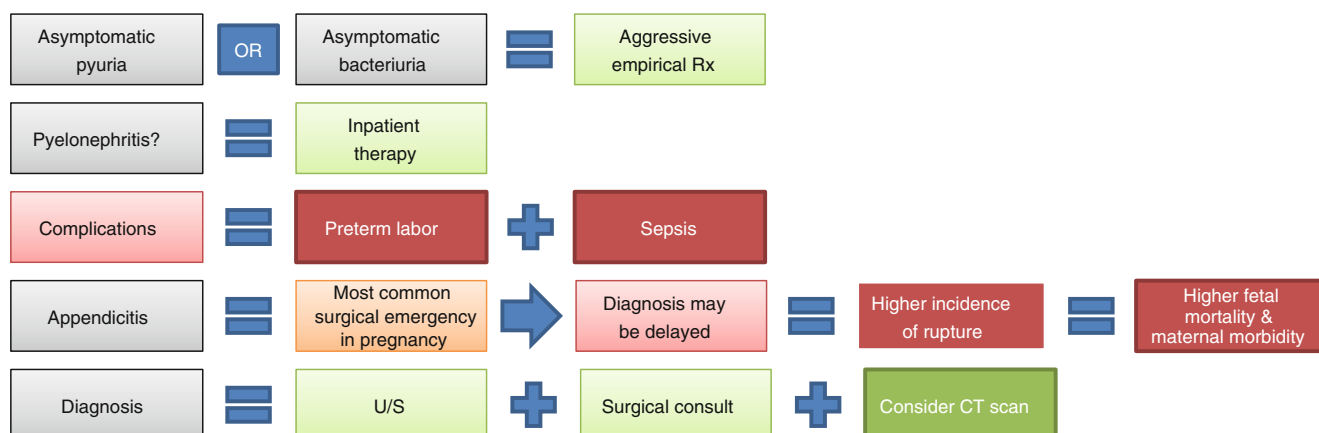


Placenta Previa

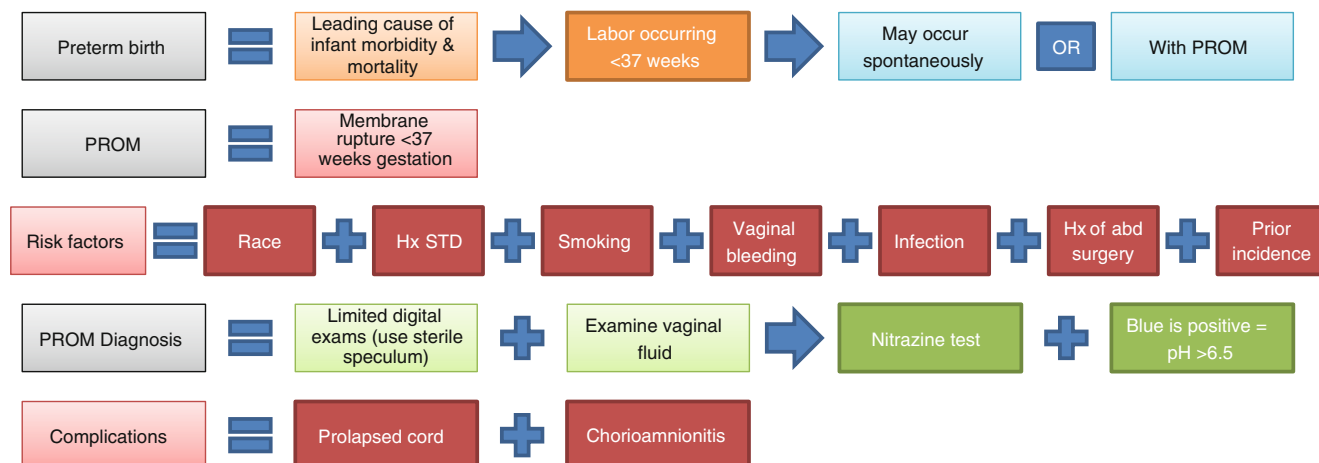


Other Emergencies of Pregnancy, Deliveries, or the Postpartum Period

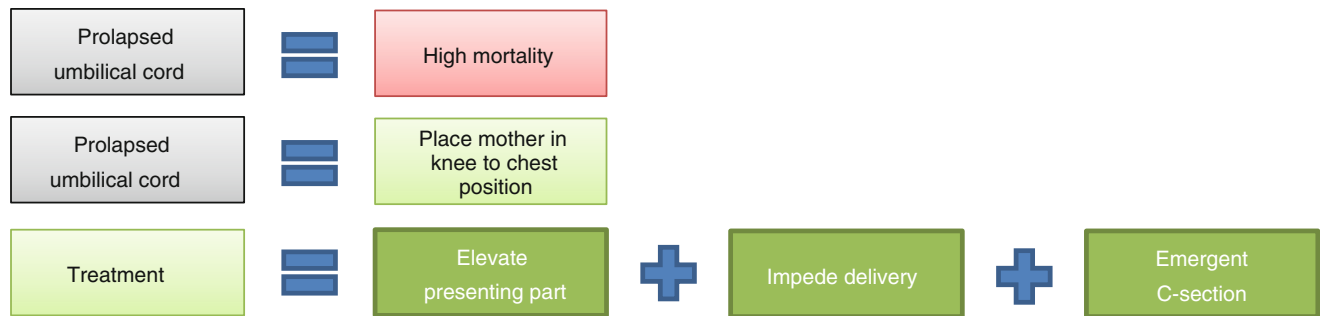
Tidbits



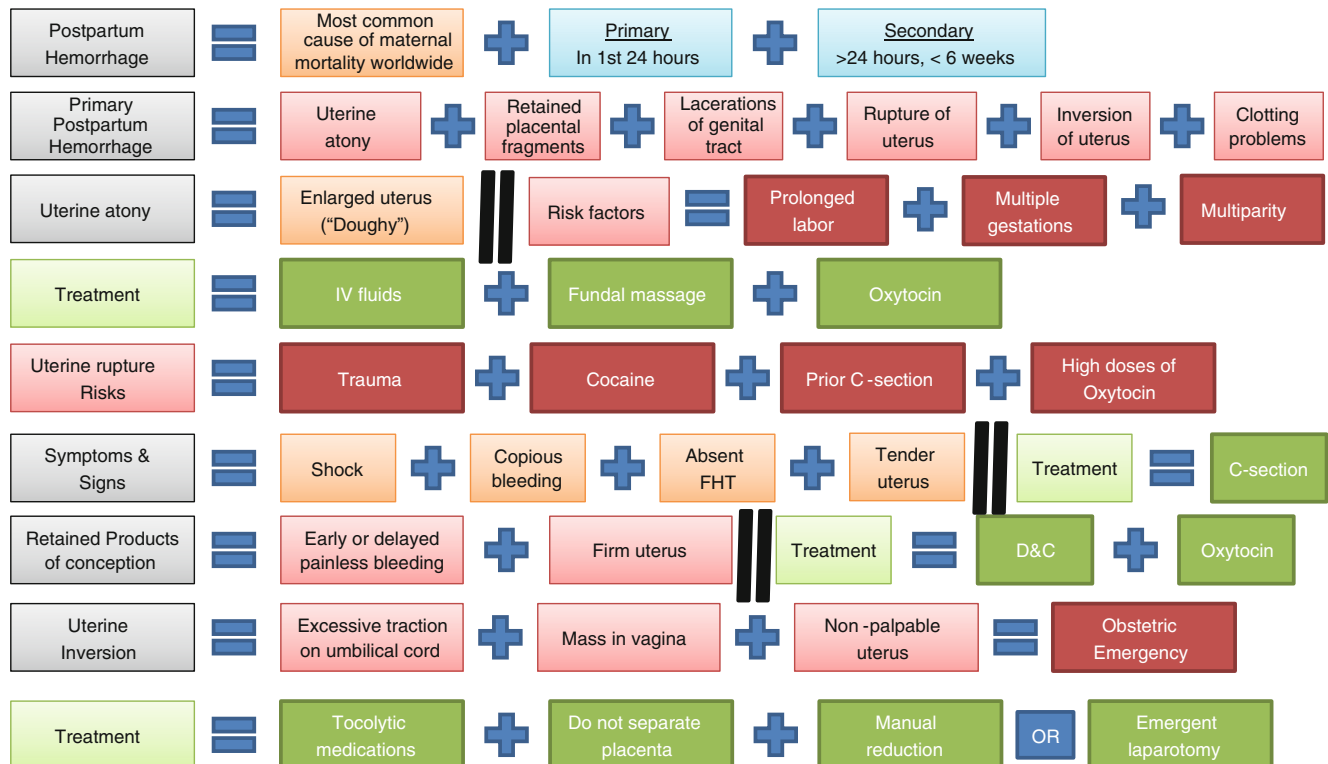
Preterm Birth and Premature Rupture of Membranes (PROM)



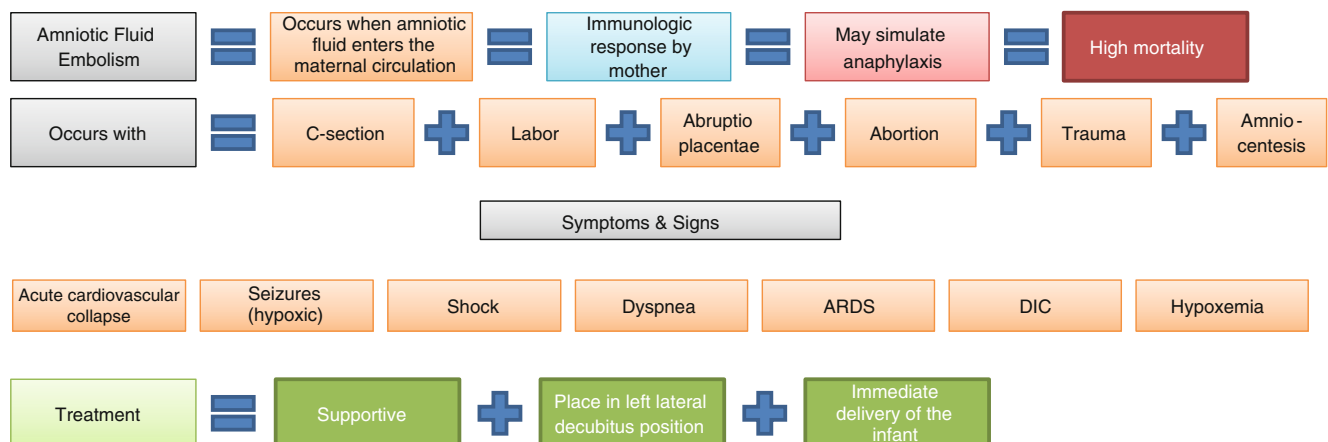
Umbilical Cord Prolapse



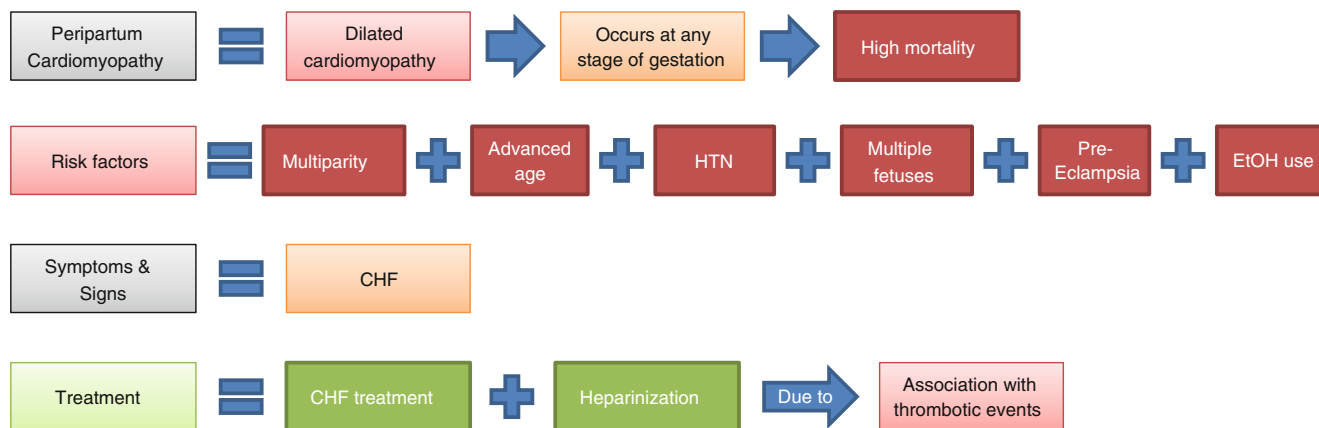
Postpartum Hemorrhage



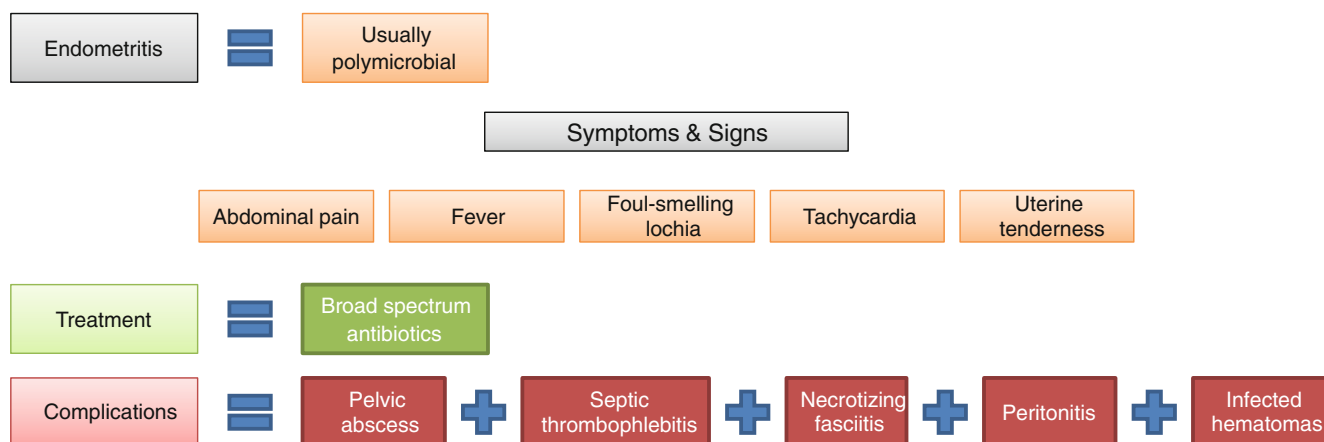
Amniotic Fluid Embolism



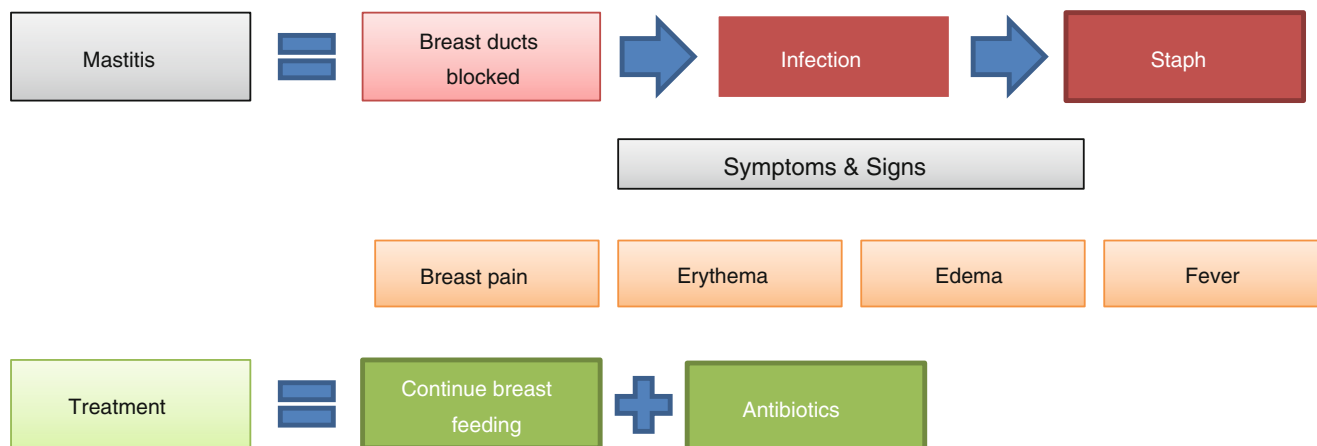
Peripartum Cardiomyopathy



Endometritis



Mastitis



Ophthalmology

Bobby Desai

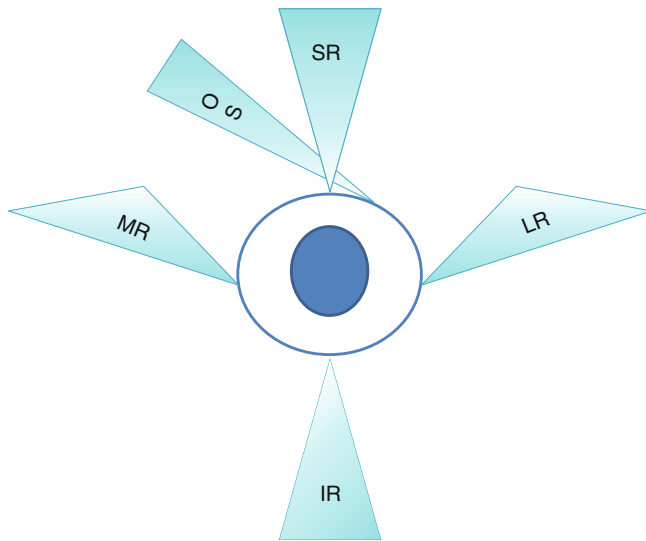
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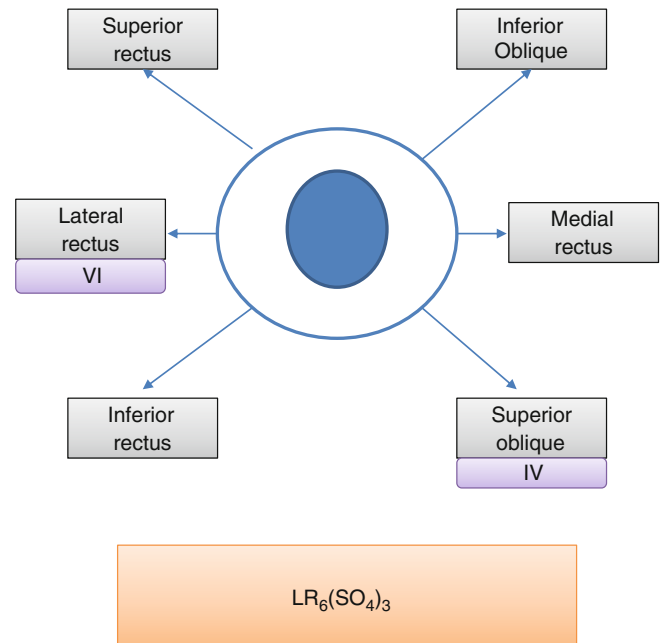
B. Desai, MD, MEd
Department of Emergency Medicine, University of Florida,
Gainesville, FL, USA
e-mail: bdesai@ufl.edu

Neuro-ophthalmology

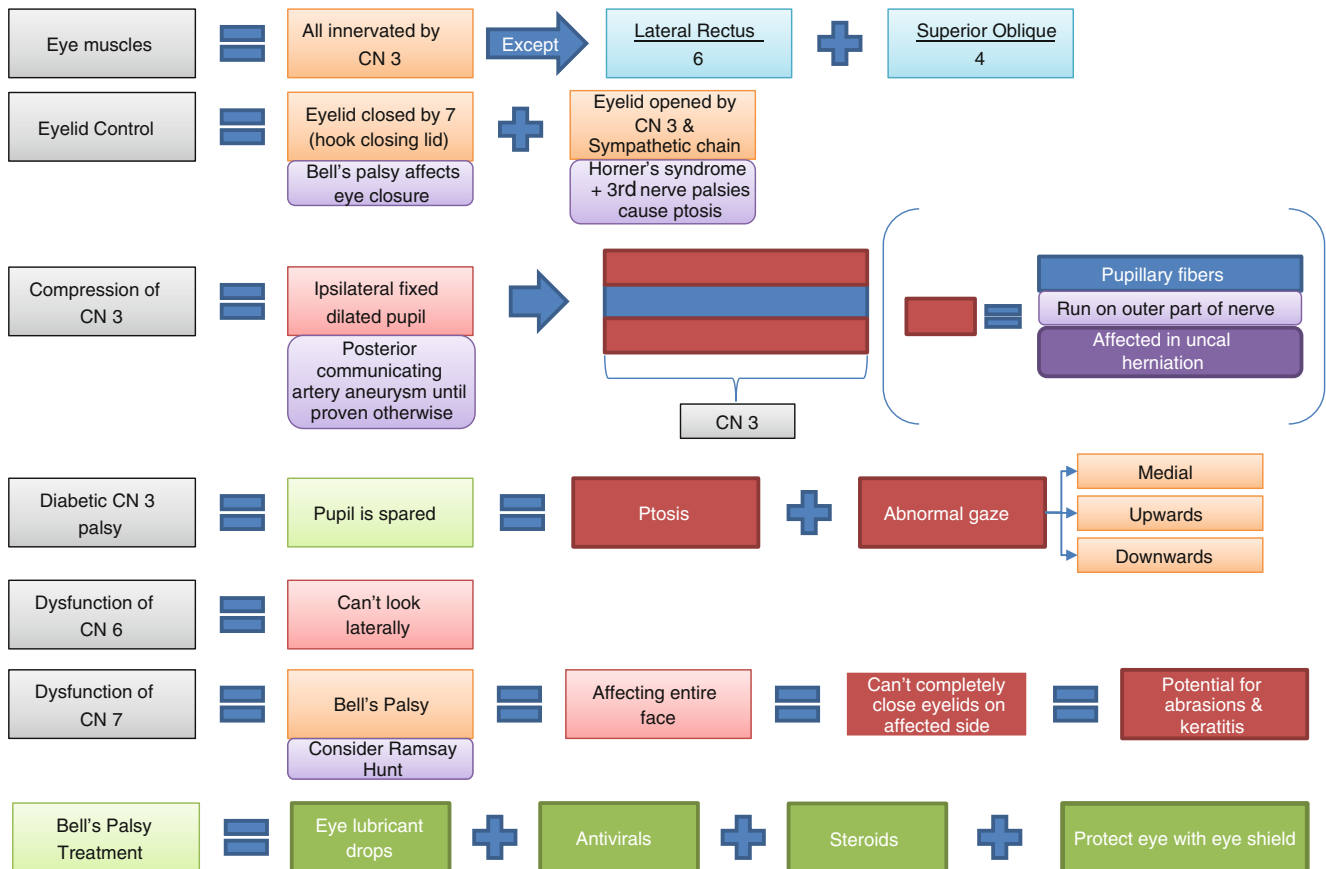
Eye Muscles: Left Eye



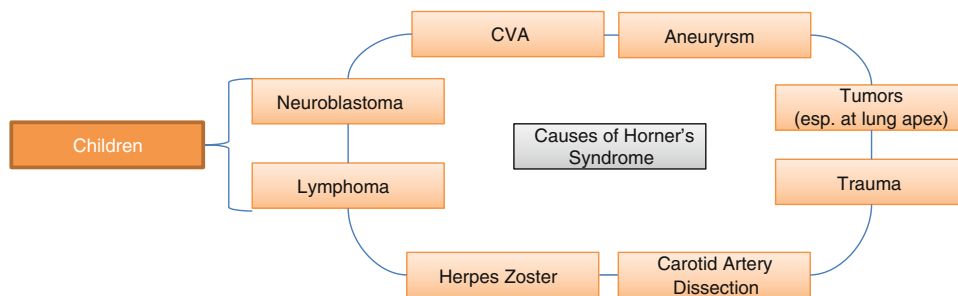
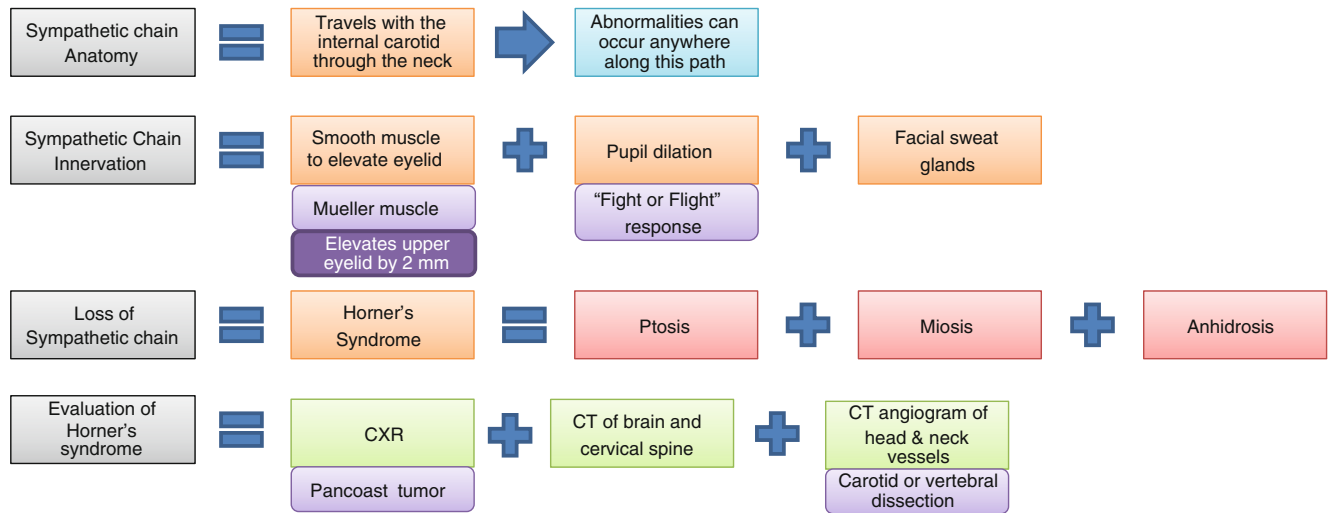
Eye Movements: Right Eye



Cranial Nerves

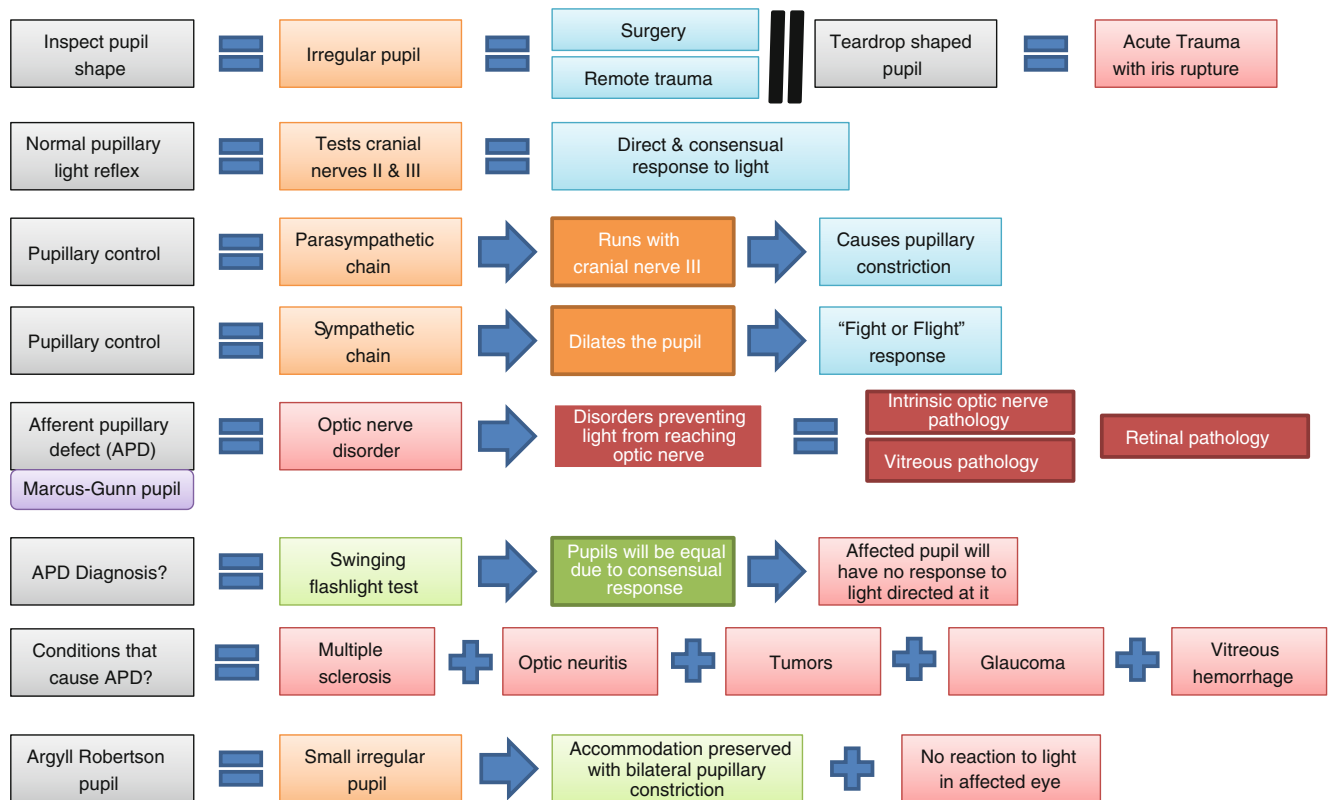


Sympathetic Chain and Horner's Syndrome



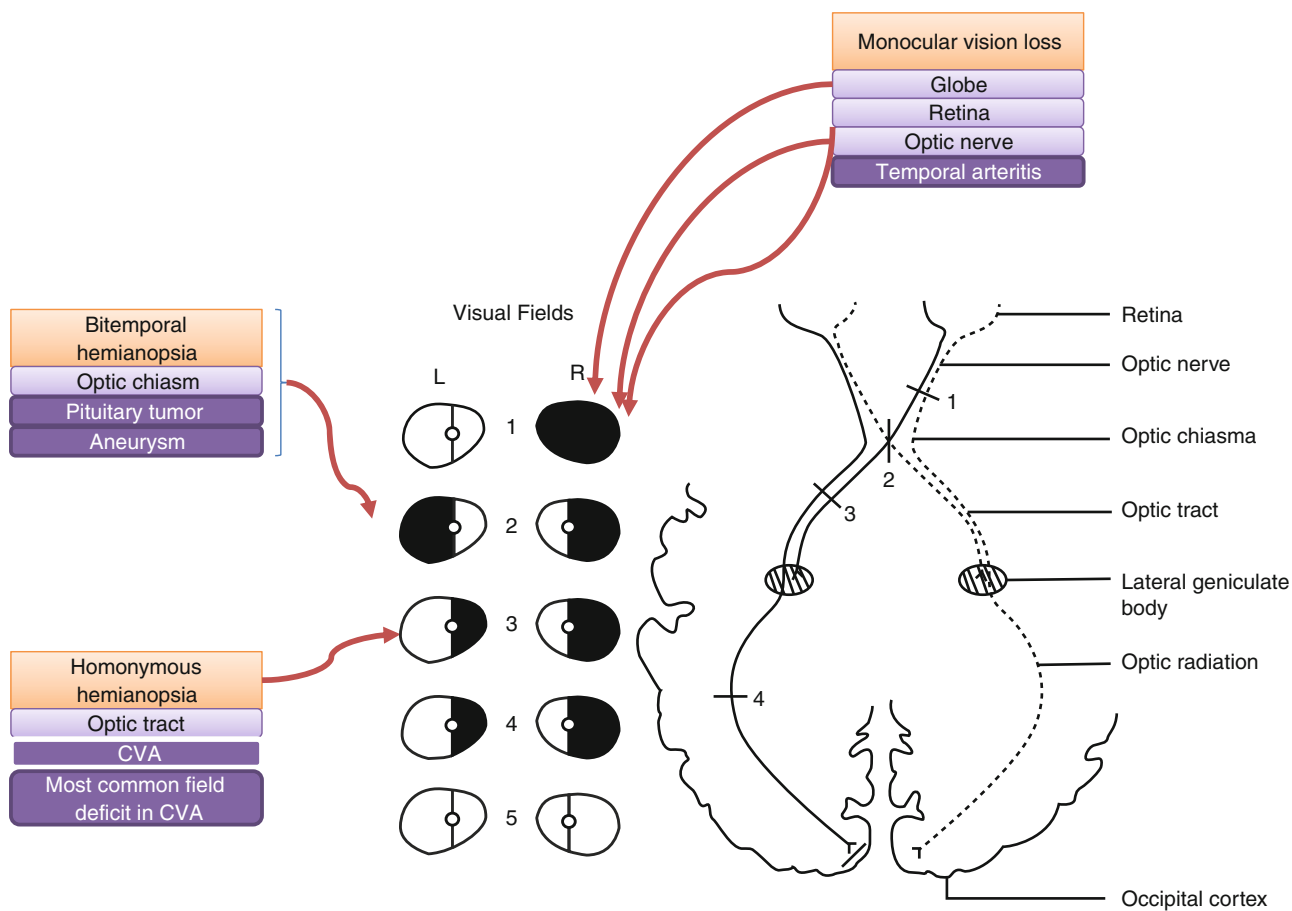
Pupil Abnormalities

Introduction



Visual Field Deficits

Visual Field Deficits



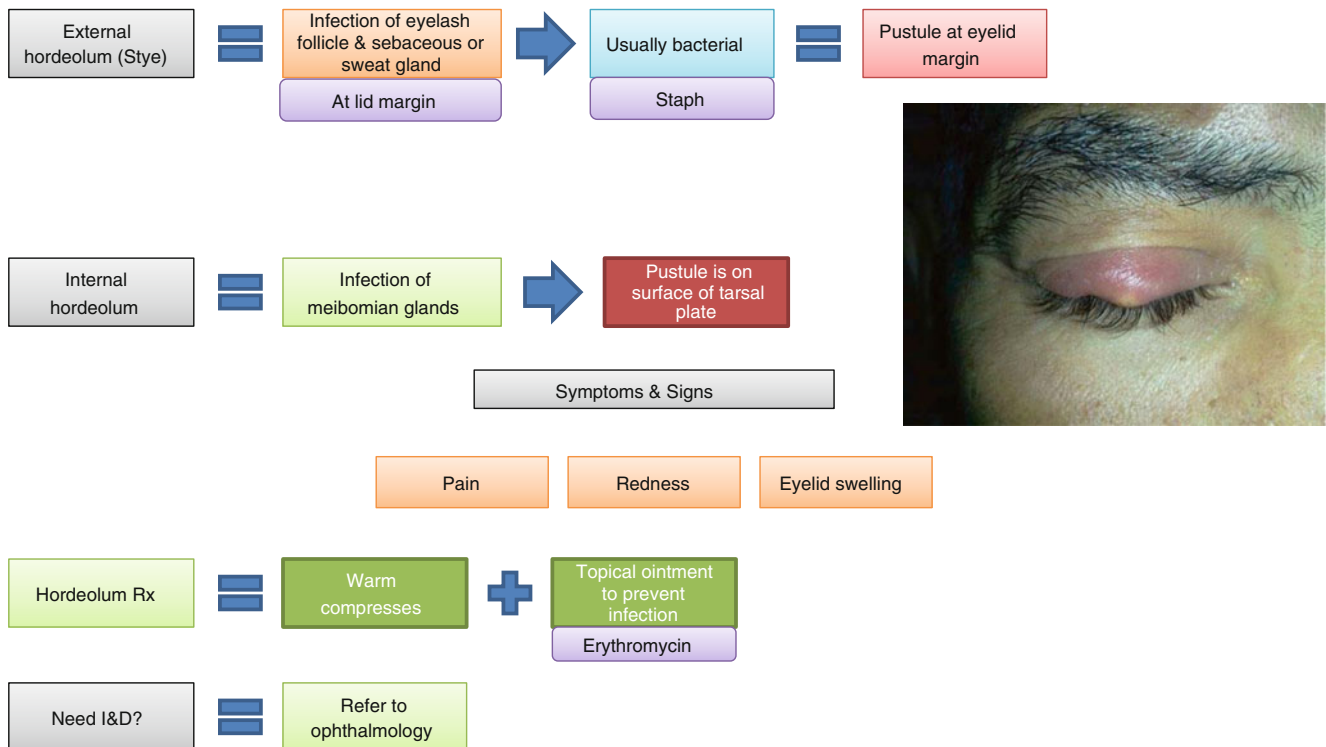
Bottom right image (Reprinted from Galloway NR, Amoaku WMK, Galloway PH, Browning AC. Neuro-ophthalmology. In: Galloway NR, Amoaku WMK, Galloway PH, Browning AC, editors. Common eye

diseases and their management. London: Springer Verlag; 2006. p. 179–88. With permission from Springer Verlag)

External Eye

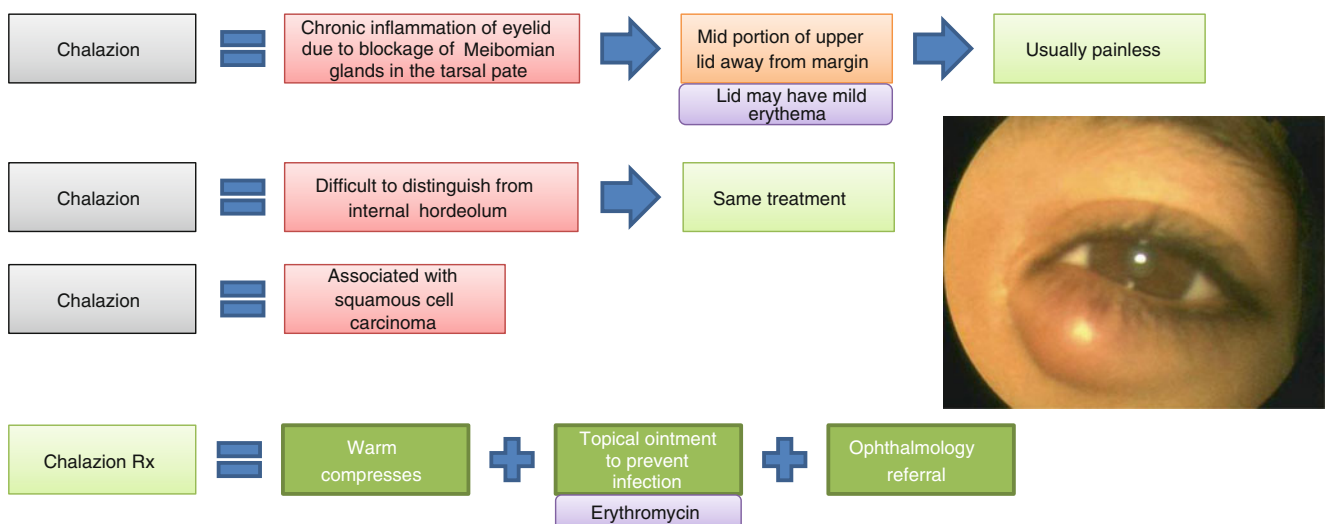
Lids

Hordeolum (External and Internal)

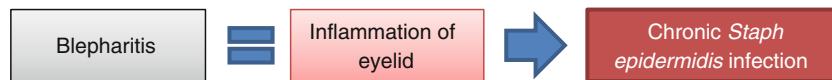
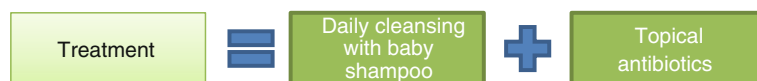
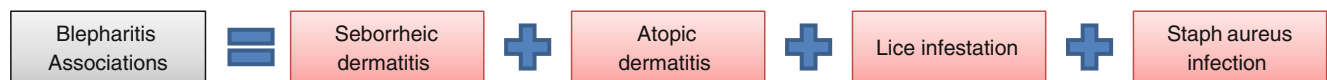


Center right image (Reprinted from Khairallah M, Kahloun R. Infections of the eyelids. In: Tabbara KF, Abu El-Asrar AM, Khairallah M, editors. Ocular infections. Heidelberg: Springer Verlag; 2014. p. 51–61. With permission from Springer Verlag)

Chalazion

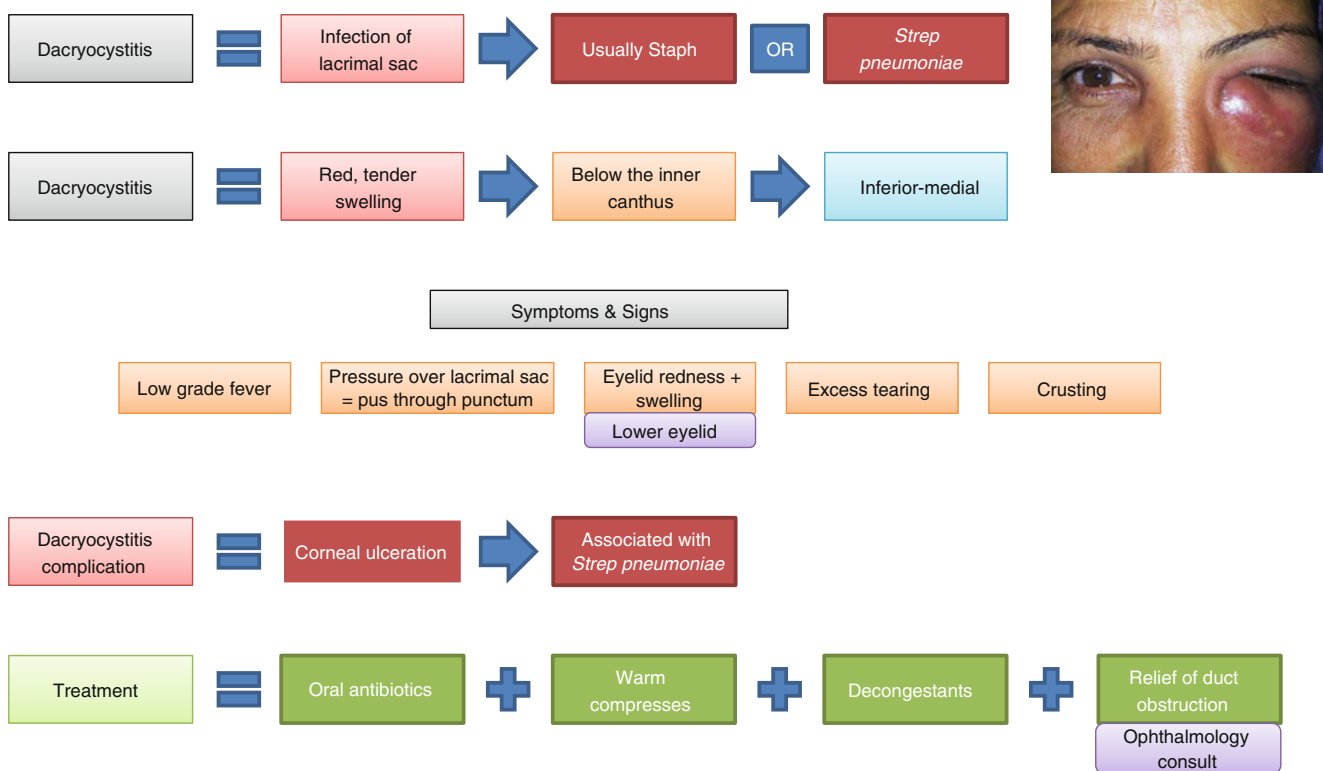


Center right image (Reprinted from Khairallah M, Kahloun R. Infections of the eyelids. In: Tabbara KF, Abu El-Asrar AM, Khairallah M, editors. Ocular infections. Heidelberg: Springer Verlag; 2014. p. 51–61. With permission from Springer Verlag)

Blepharitis**Symptoms & Signs**

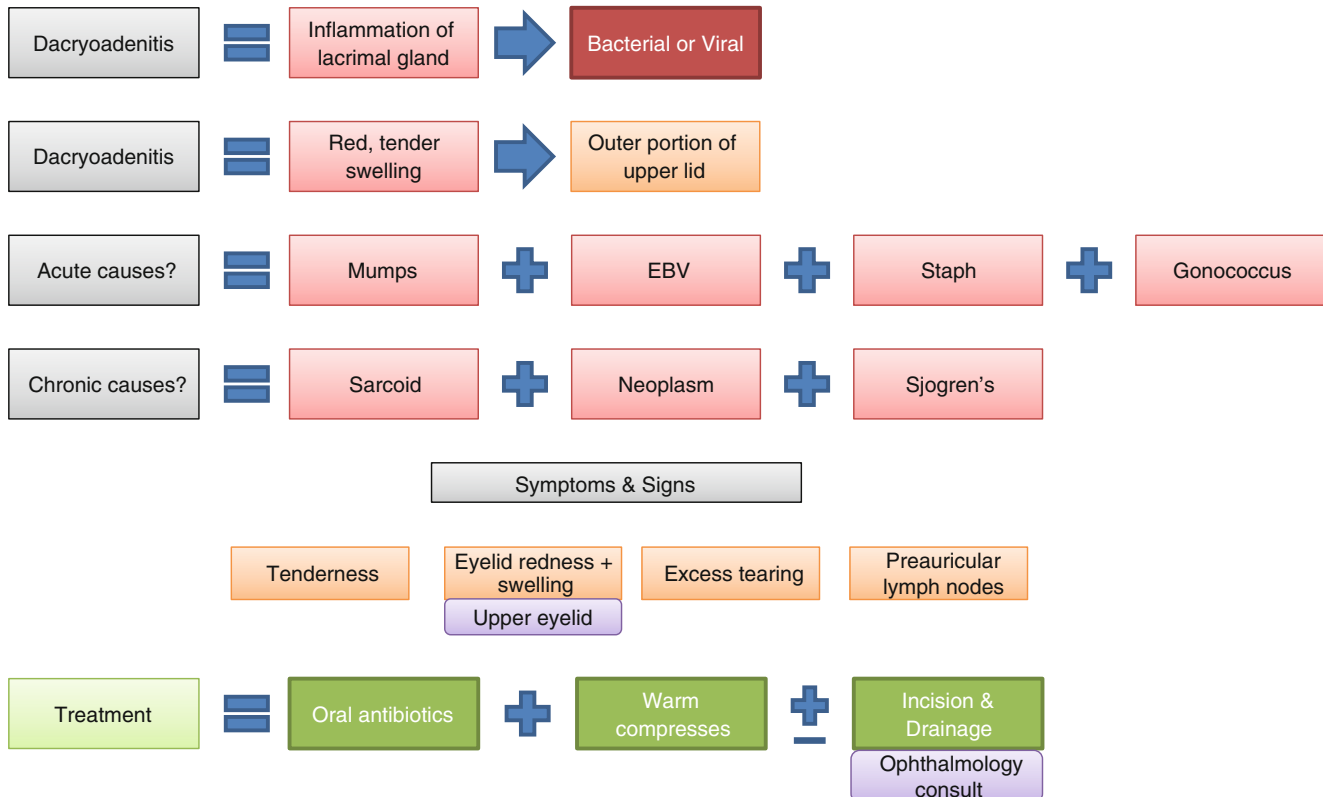
Bottom right image (Reprinted from Khairallah M, Kahloun R. Infections of the eyelids. In: Tabbara KF, Abu El-Asrar AM, Khairallah M, editors. Ocular infections. Heidelberg: Springer Verlag; 2014. p. 51–61. With permission from Springer Verlag)

Dacryocystitis



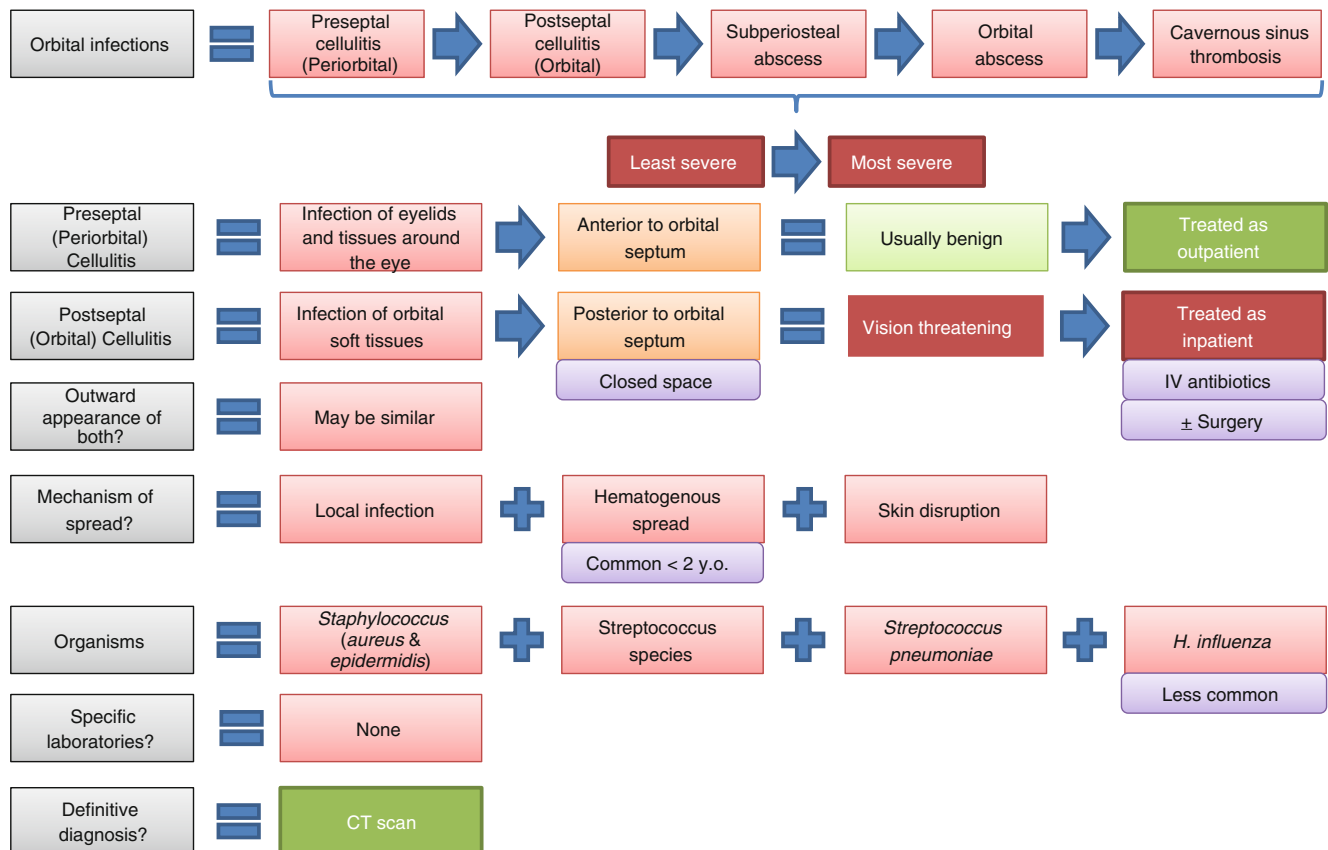
Top right image (Reprinted from Khairallah M, Attia S. Infections of the orbit. In: Tabbara KF, Abu El-Asrar AM, Khairallah M, editors. Ocular infections. Heidelberg: Springer Verlag; 2014. p. 37–43. With permission from Springer Verlag)

Dacryoadenitis



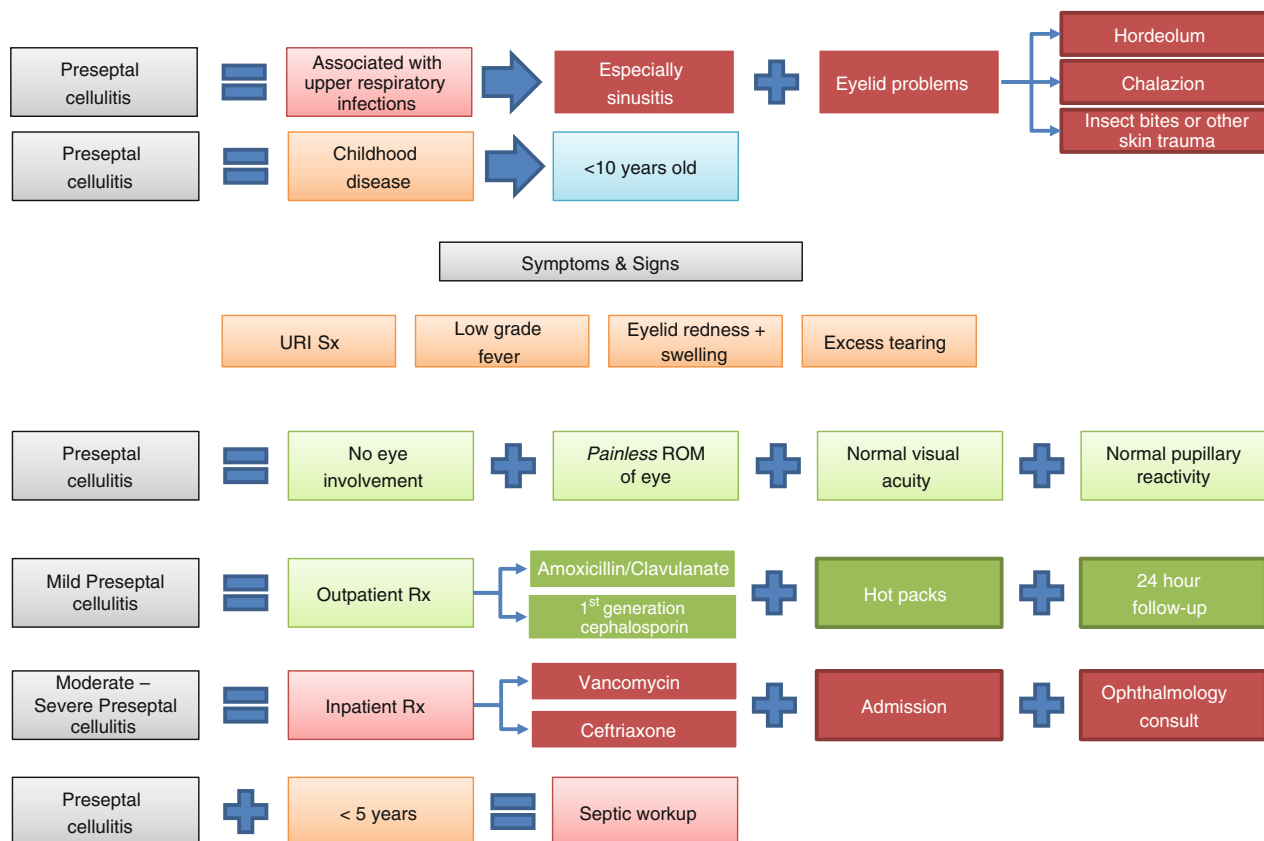
Periorbital and Orbital Cellulitis

Introduction: Orbital Infections

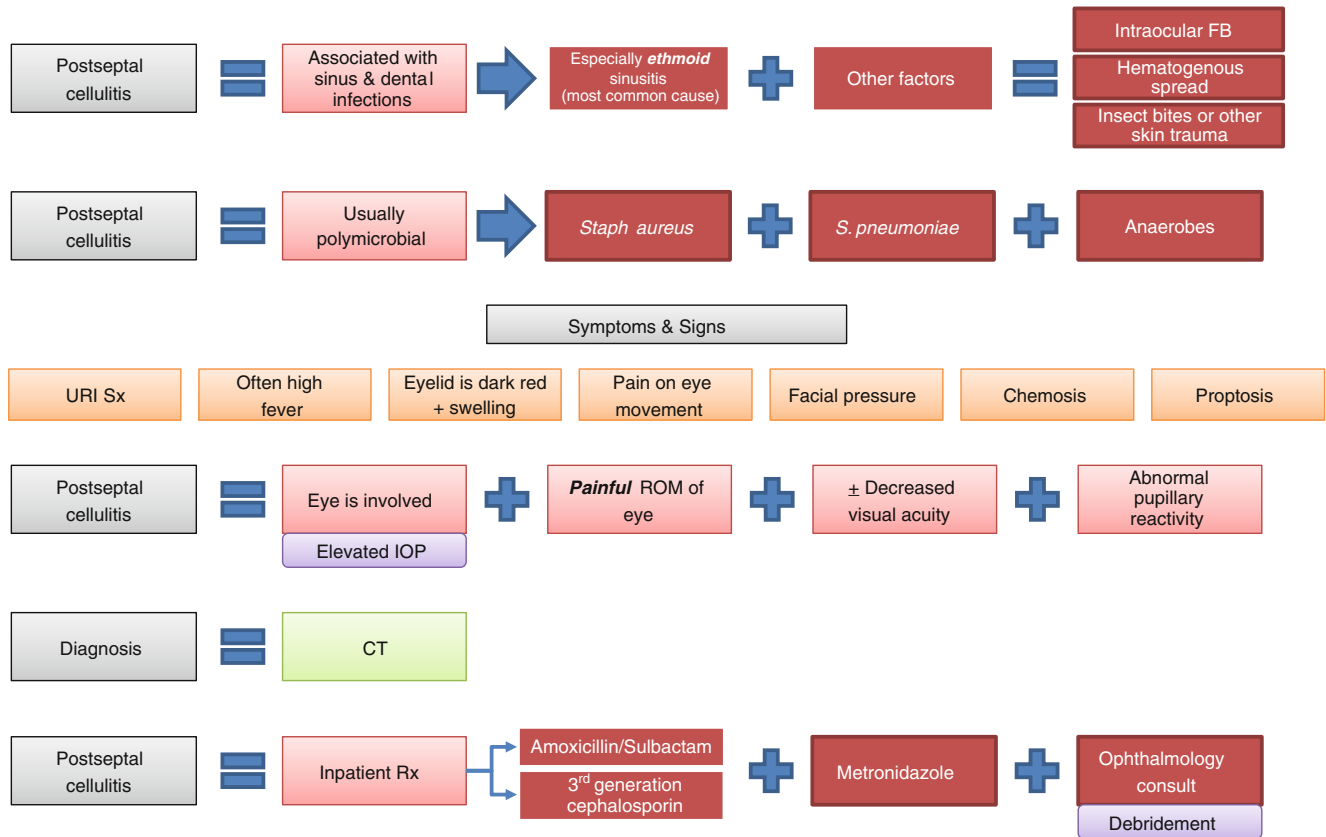


Preseptal Cellulitis

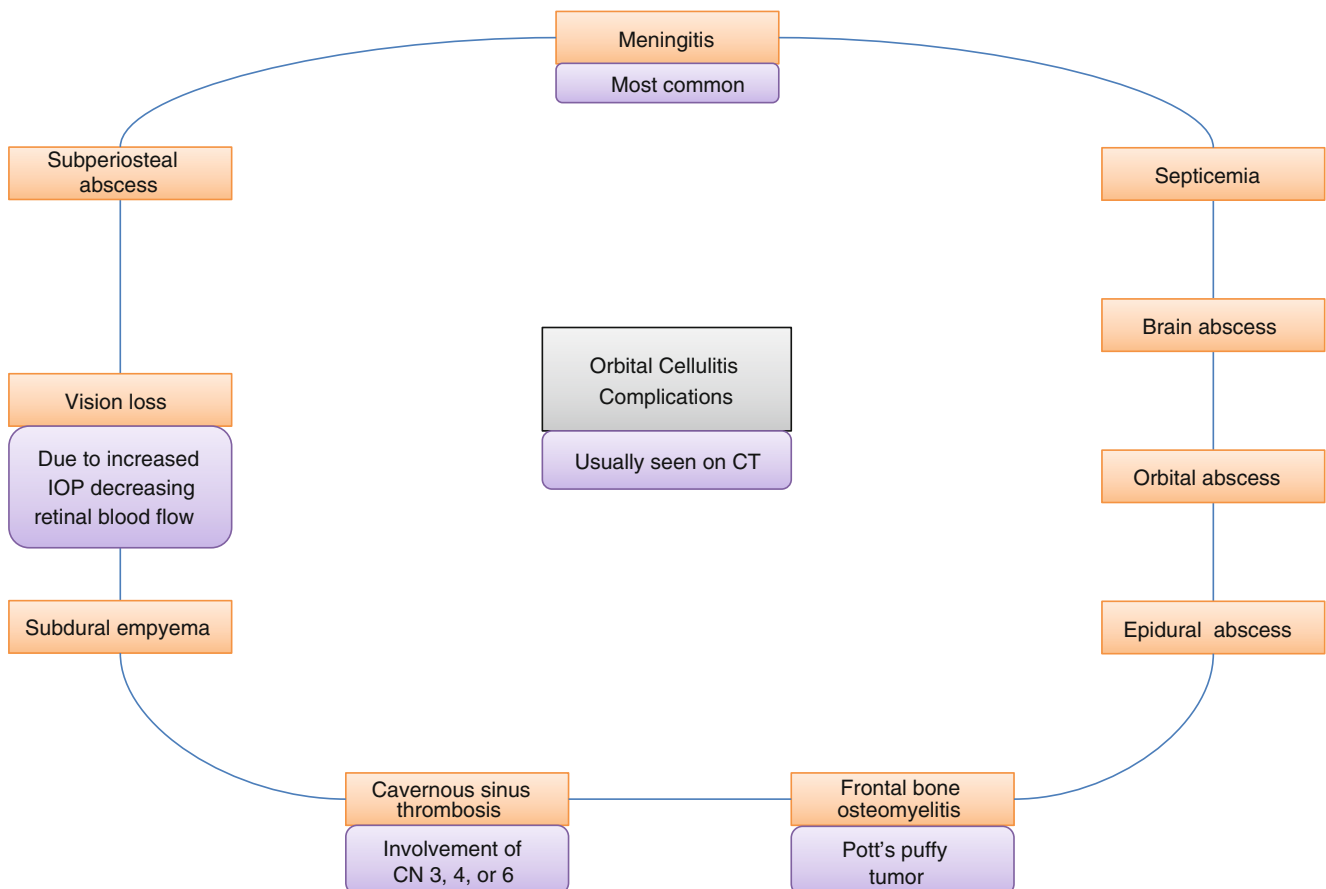
PEDIATRICS



Postseptal Cellulitis



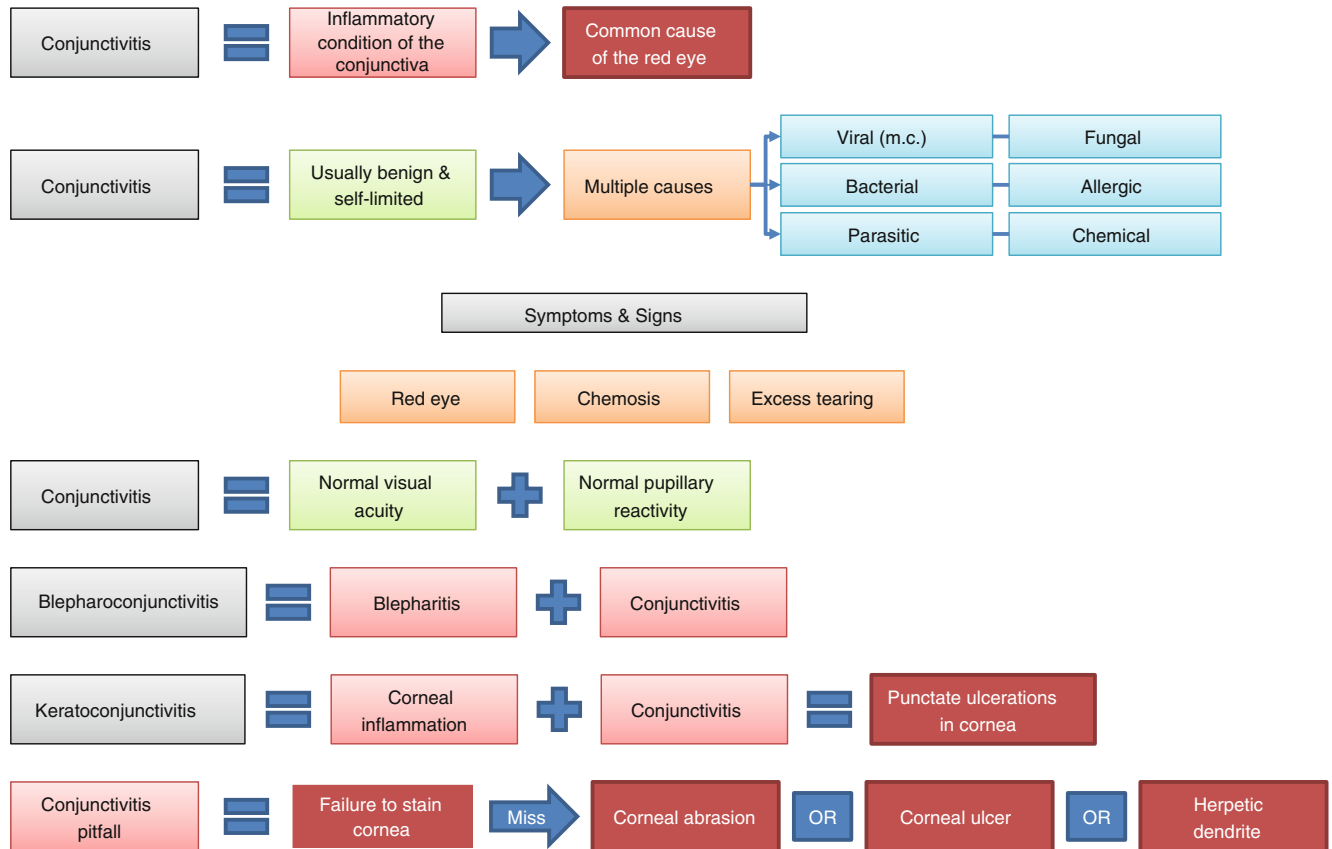
Orbital Cellulitis Complications



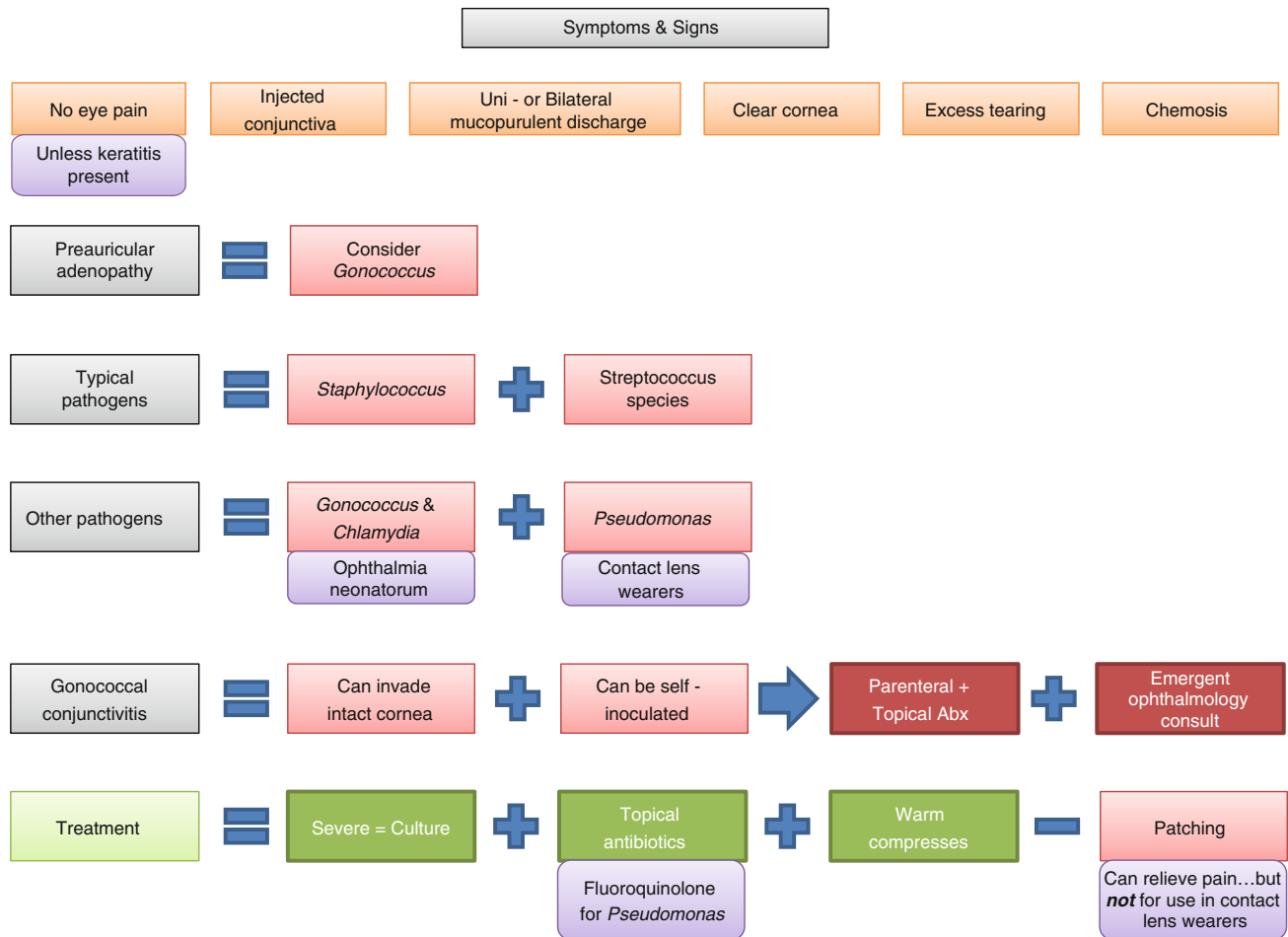
Conjunctiva

Conjunctivitis

Introduction

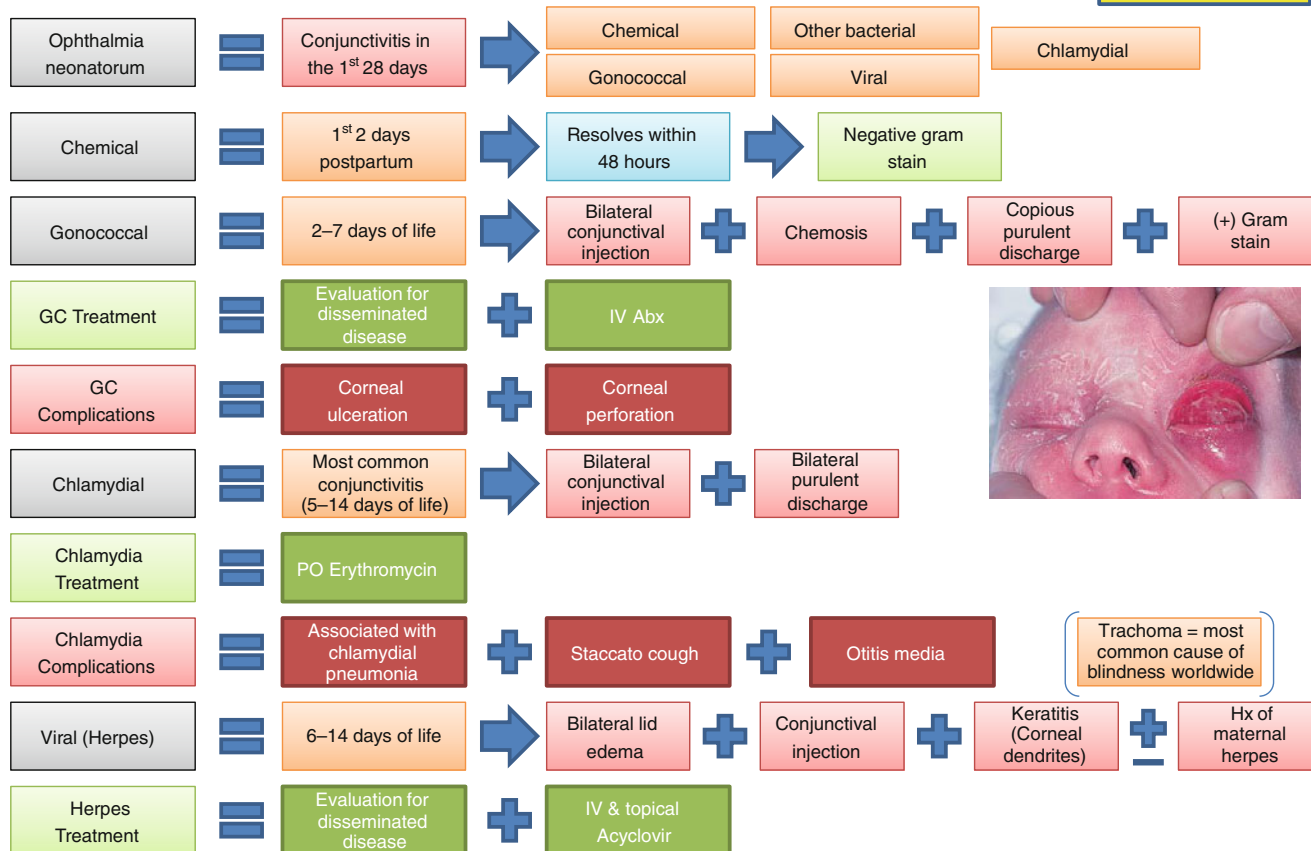


Bacterial Conjunctivitis



Ophthalmia Neonatorum

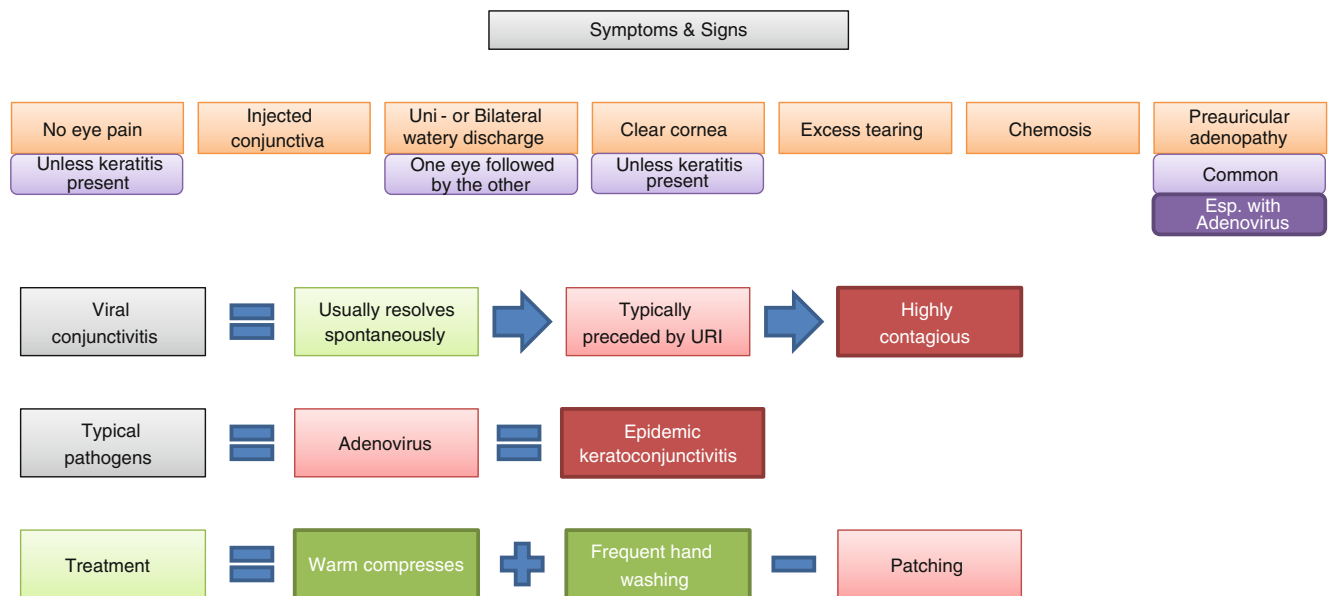
PEDIATRICS



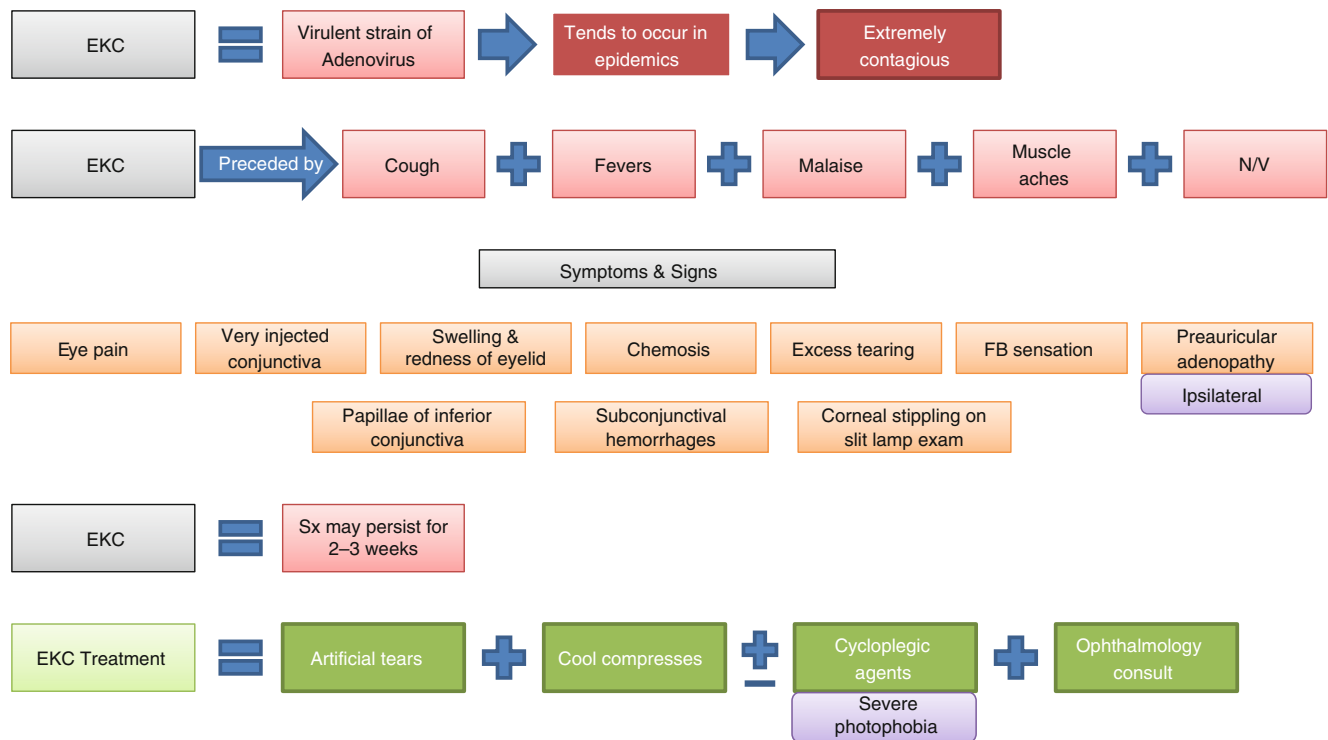
Center right image (Reprinted from Galloway NR, Amoaku WMK, Galloway PH, Browning AC. Common diseases of the conjunctiva and cornea. In: Galloway NR, Amoaku WMK, Galloway PH, Browning AC,

editors. Common eye diseases and their management. London: Springer Verlag; 2006. p. 45–60. With permission from Springer Verlag)

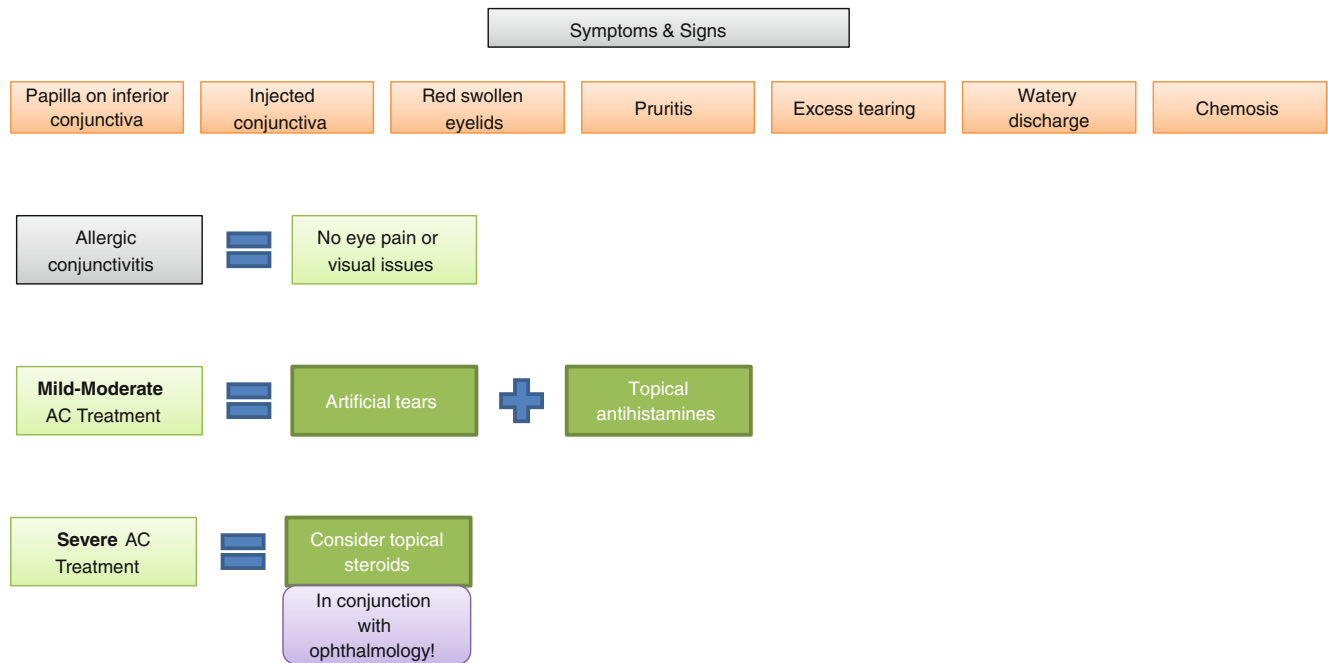
Viral Conjunctivitis



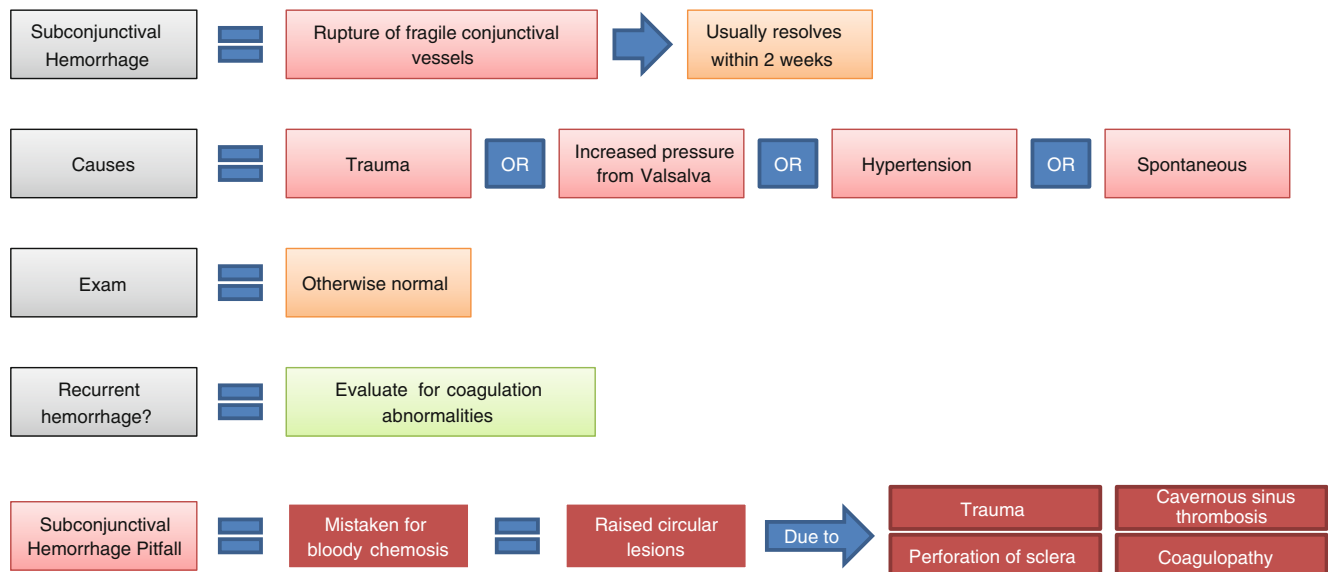
Epidemic Keratoconjunctivitis (EKC)



Allergic Conjunctivitis (AC)



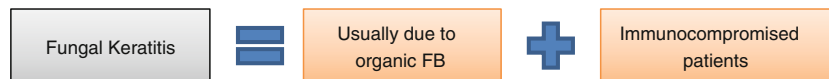
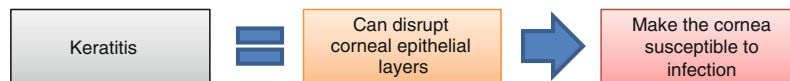
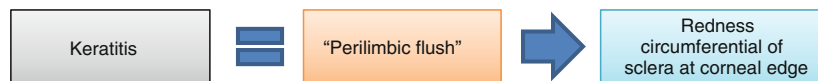
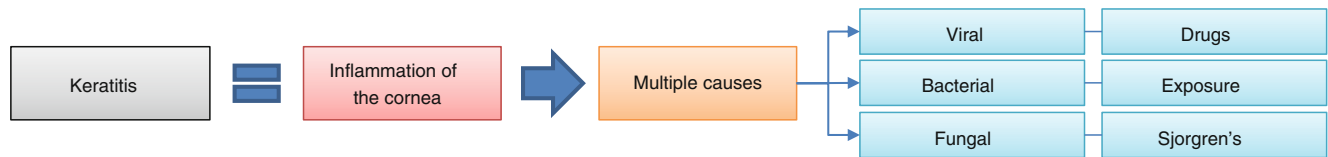
Subconjunctival Hemorrhage



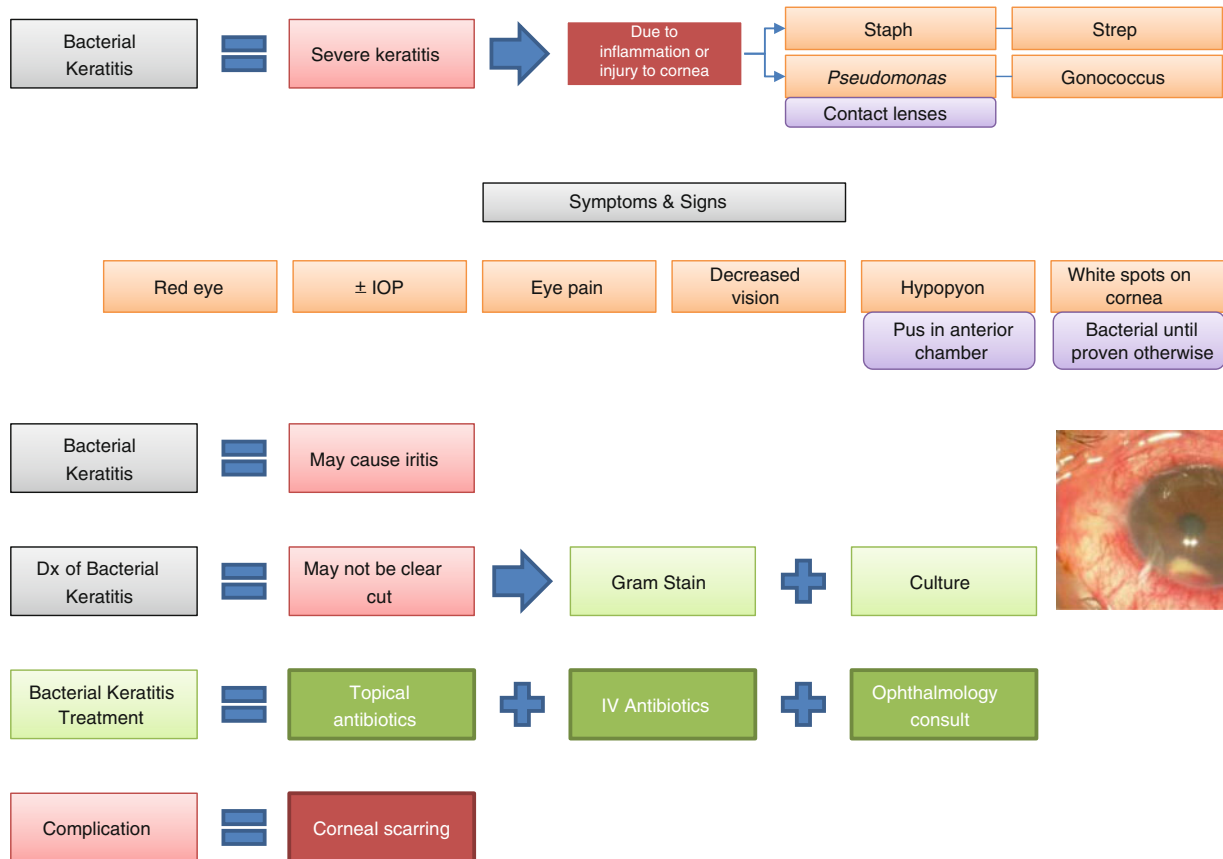
Cornea

Keratitis

Introduction

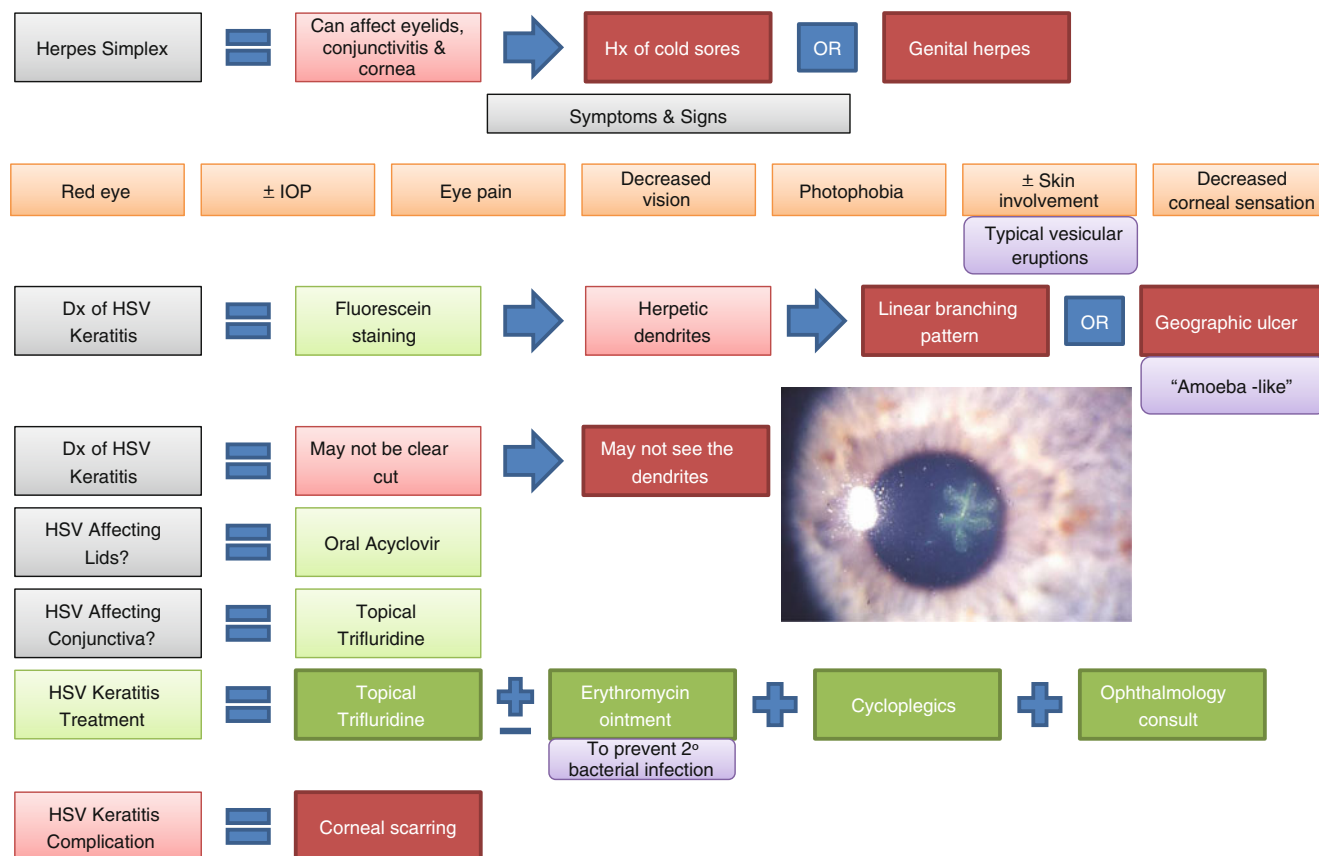


Bacterial Keratitis



Center right image (Reprinted from Mete G, Turgut Y, Osman A, Gülşen Ü, Hakan A. Anterior segment intraocular metallic foreign body causing chronic hypopyon uveitis. J Ophthalmic Inflamm Infect. 2011;1(2):85–7. With permission from Springer Verlag)

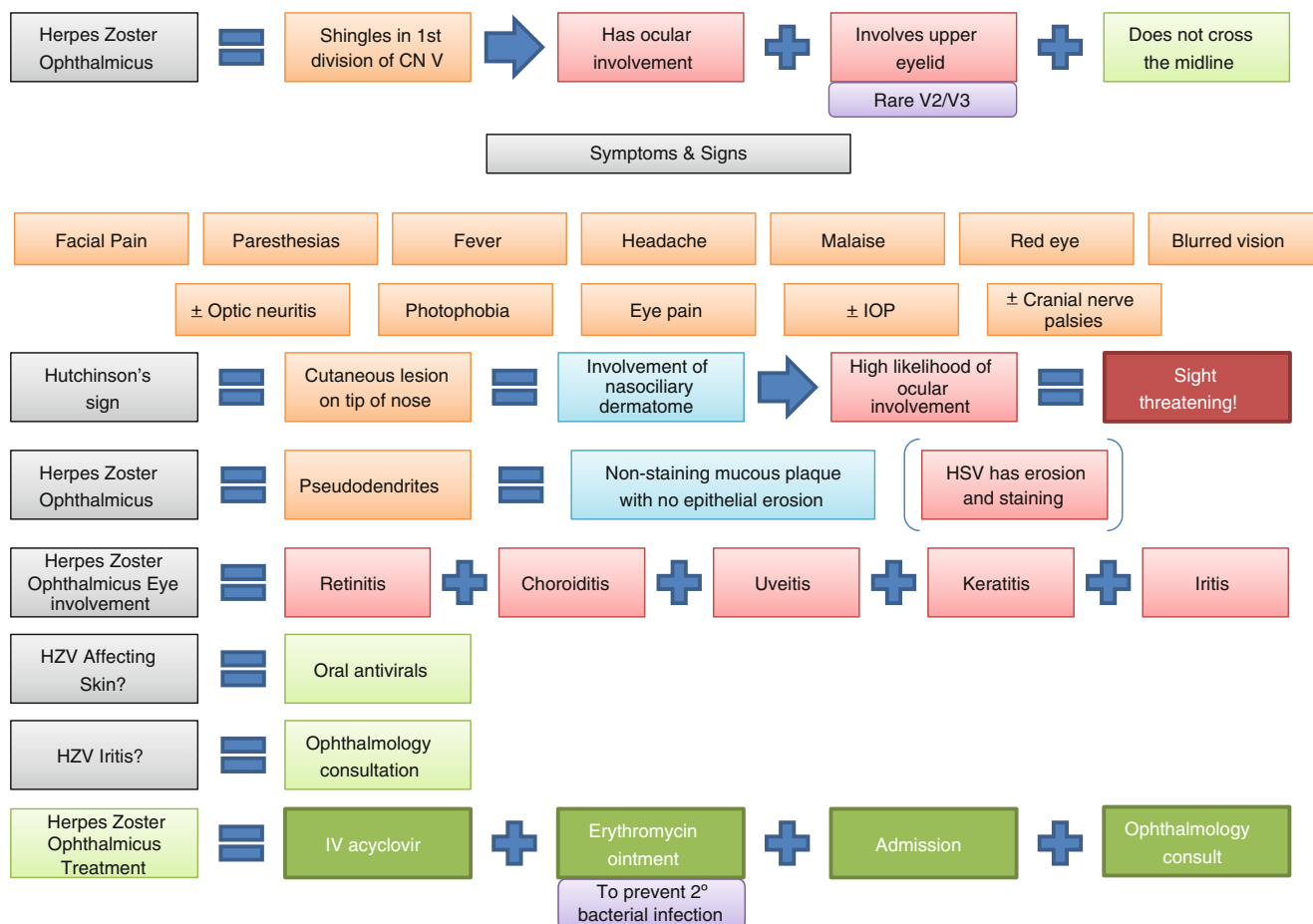
HSV Keratitis



Center right image (Reprinted from Sundmacher R. Herpes simplex virus (HSV) diseases of the anterior segment and the adnexa. In: Sundmacher R, editor. Color atlas of herpetic eye disease: a practical

guide to clinical management. Heidelberg: Springer Verlag; 2008. p. 5–112. With permission from Springer Verlag)

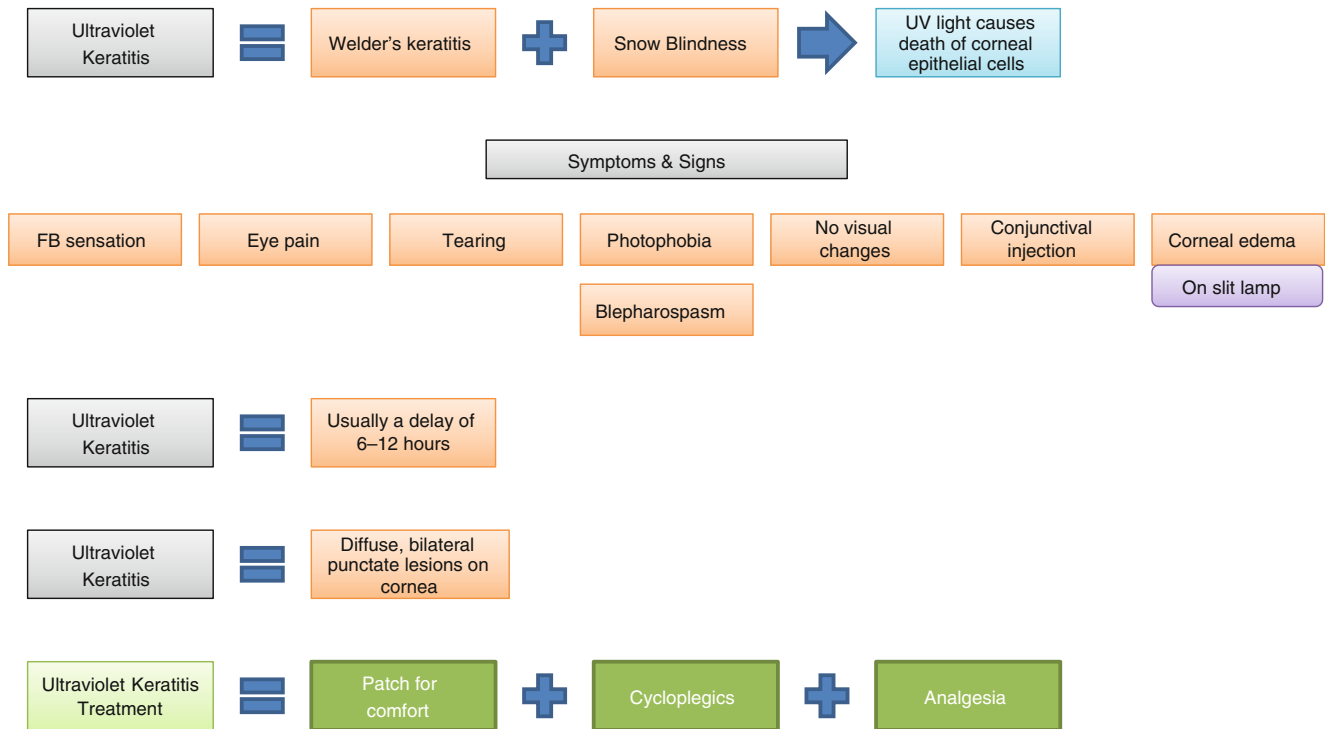
Herpes Zoster Ophthalmicus



Center image (Reprinted from Sundmacher R. Varicella zoster virus (VZV) diseases of the anterior segment and the adnexes. In: Sundmacher R, editor. Color atlas of herpetic eye disease: a practical

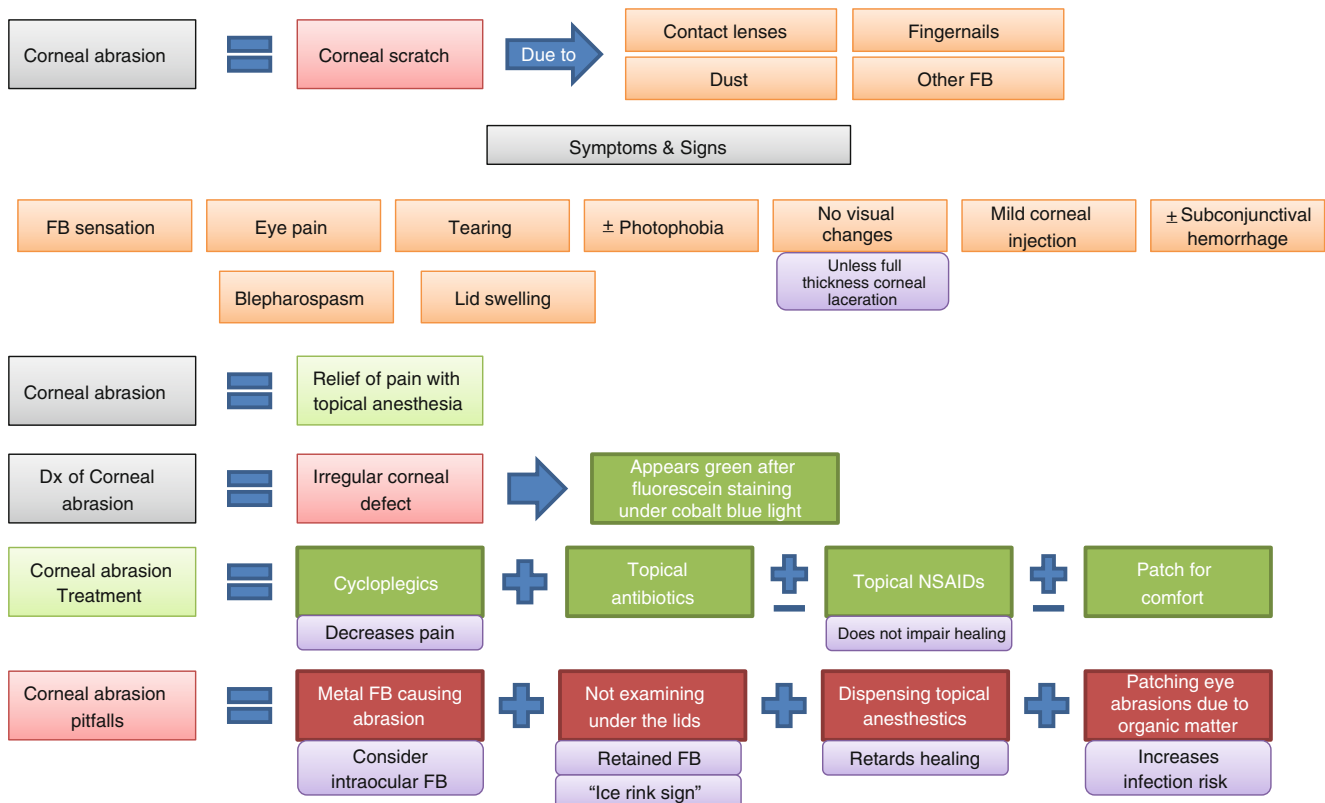
guide to clinical management. Heidelberg: Springer Verlag; 2008. p. 113–57. With permission from Springer Verlag)

Ultraviolet Keratitis

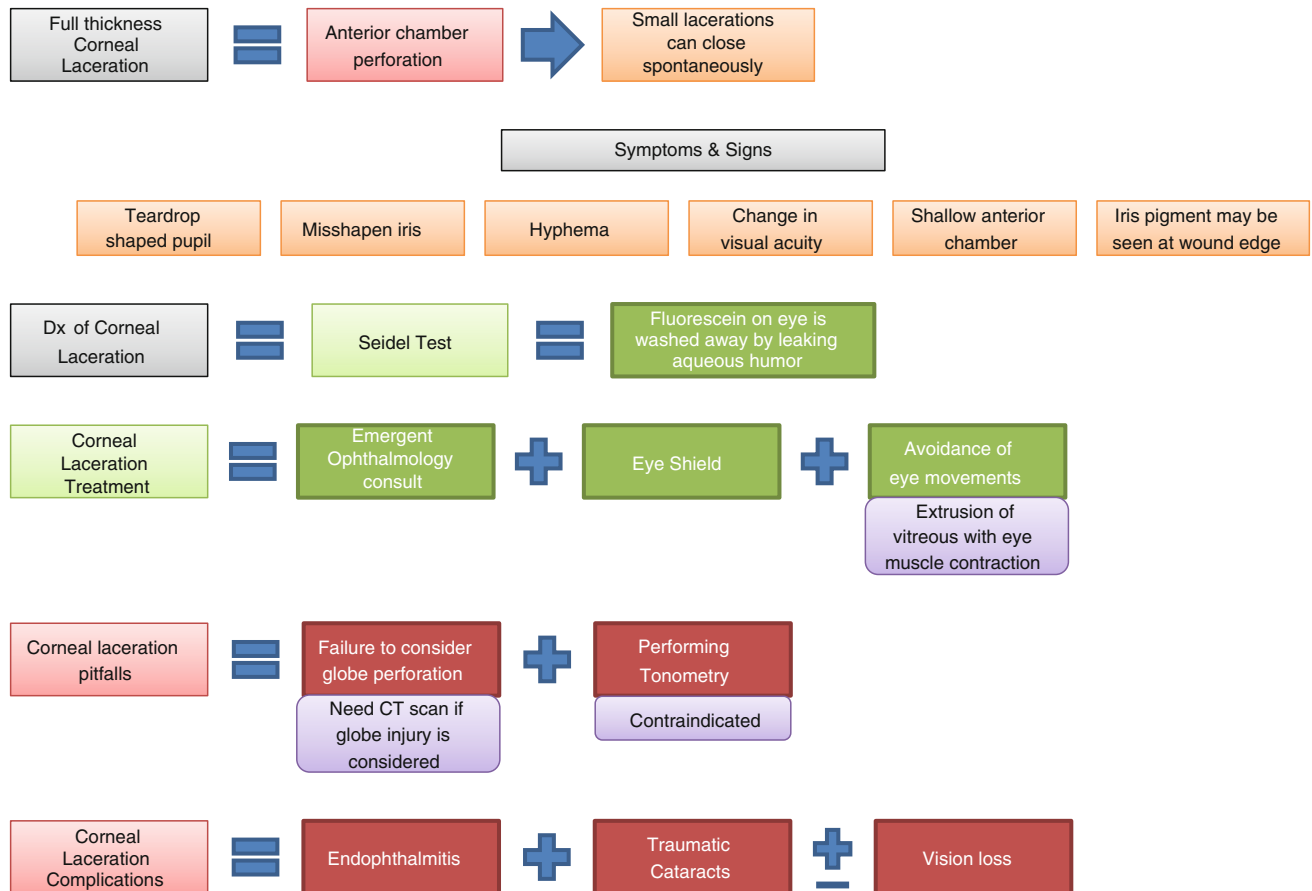


Corneal Abrasion, Laceration, and Ulcers

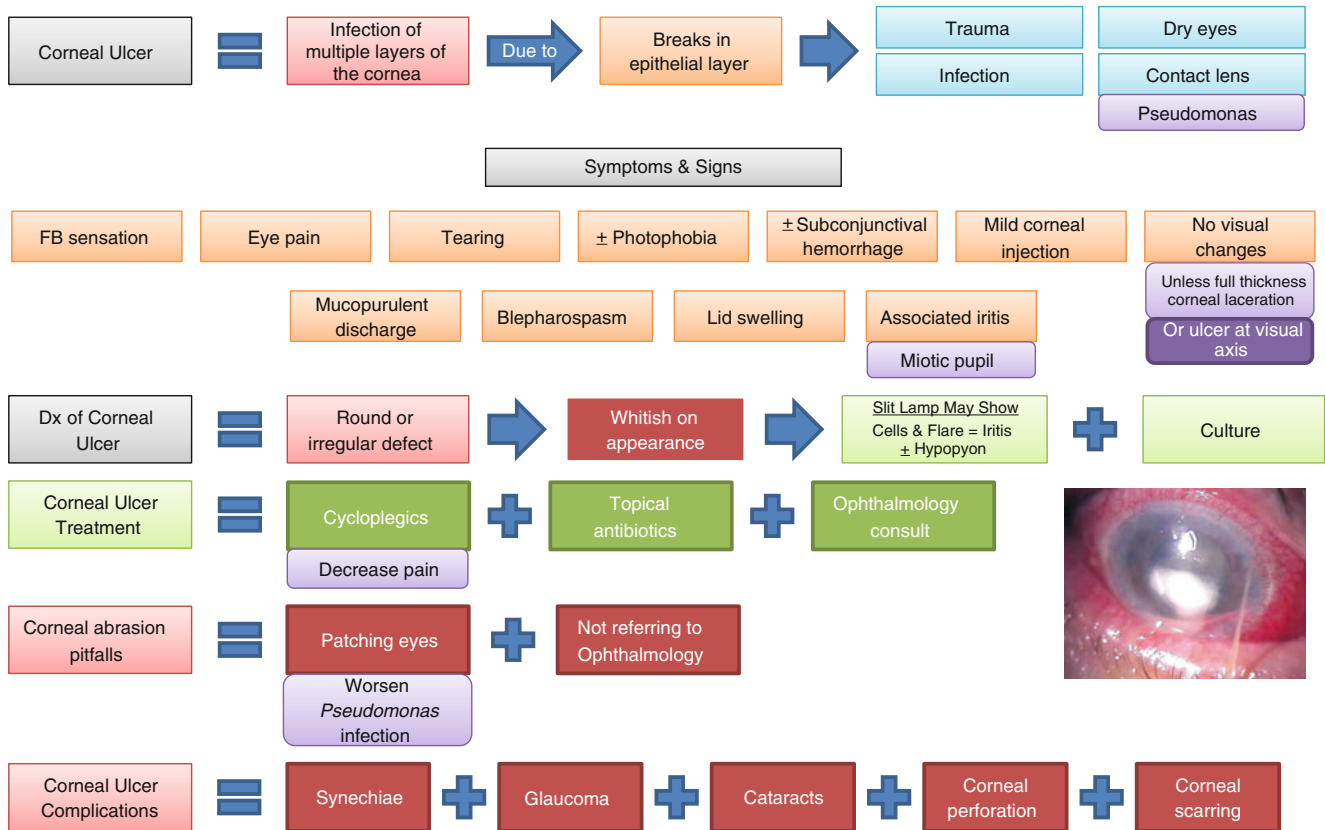
Corneal Abrasion



Corneal Lacerations



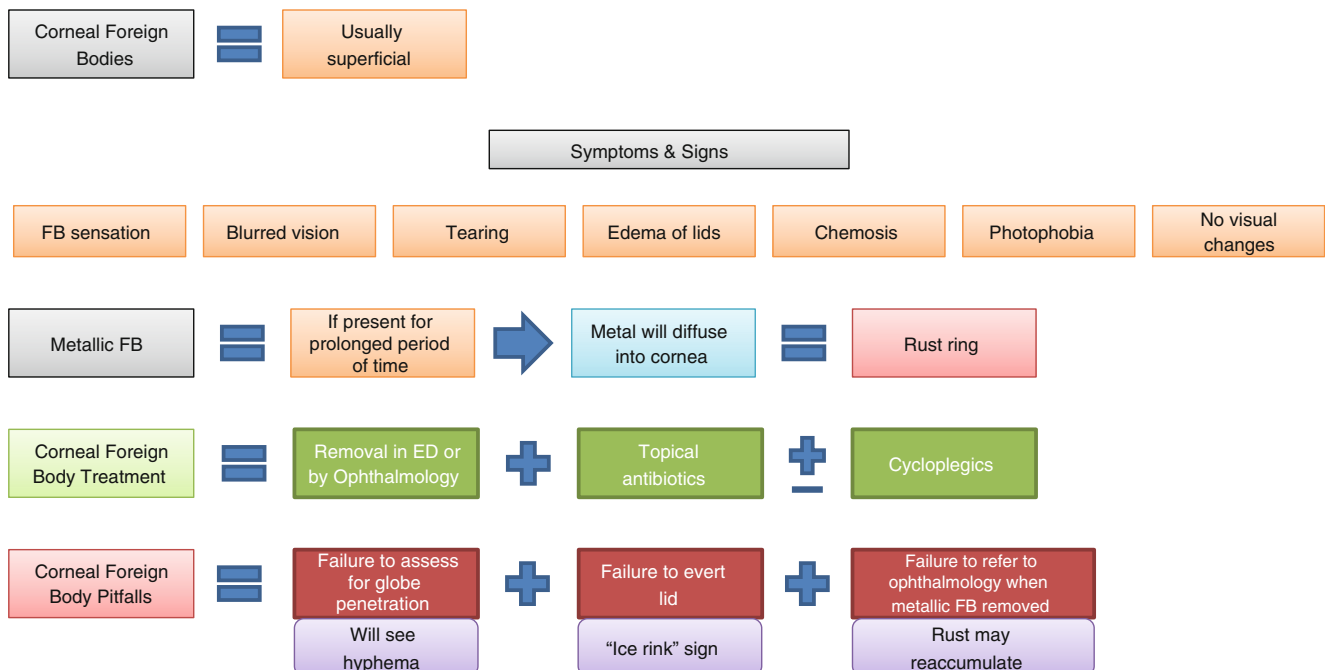
Corneal Ulcers



Bottom right image (Reprinted from Heiligenhaus A, Heinz C, Schmitz K, Tappeiner C, Bauer D, Meller D. Amniotic membrane transplantation for the treatment of corneal ulceration in infectious keratitis. In:

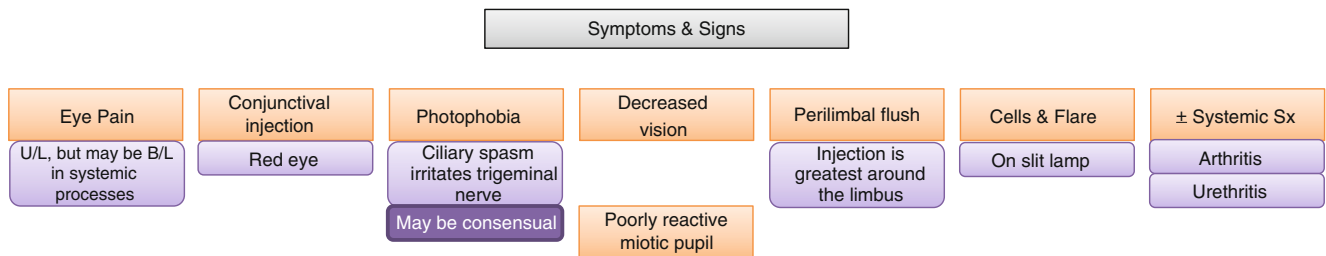
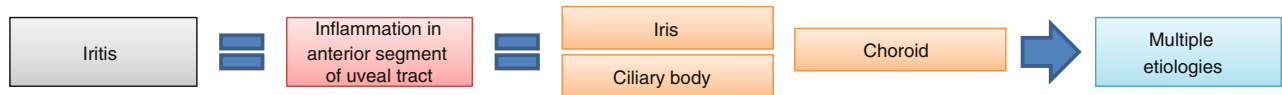
Reinhard T, Larkin F, editors. Cornea and external eye disease. Heidelberg: Springer Verlag; 2008. p. 15–36. With permission from Springer Verlag)

Corneal Foreign Bodies

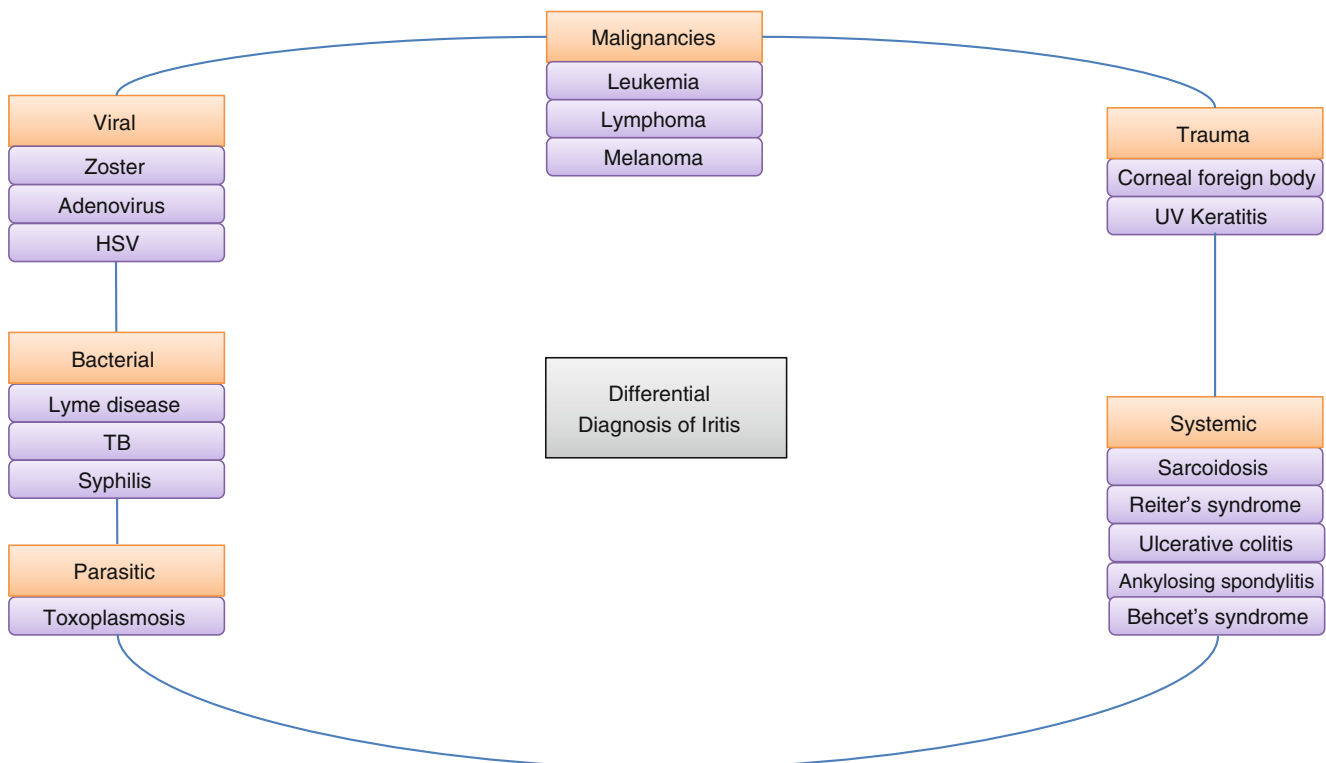


Uveitis and Iritis

Introduction

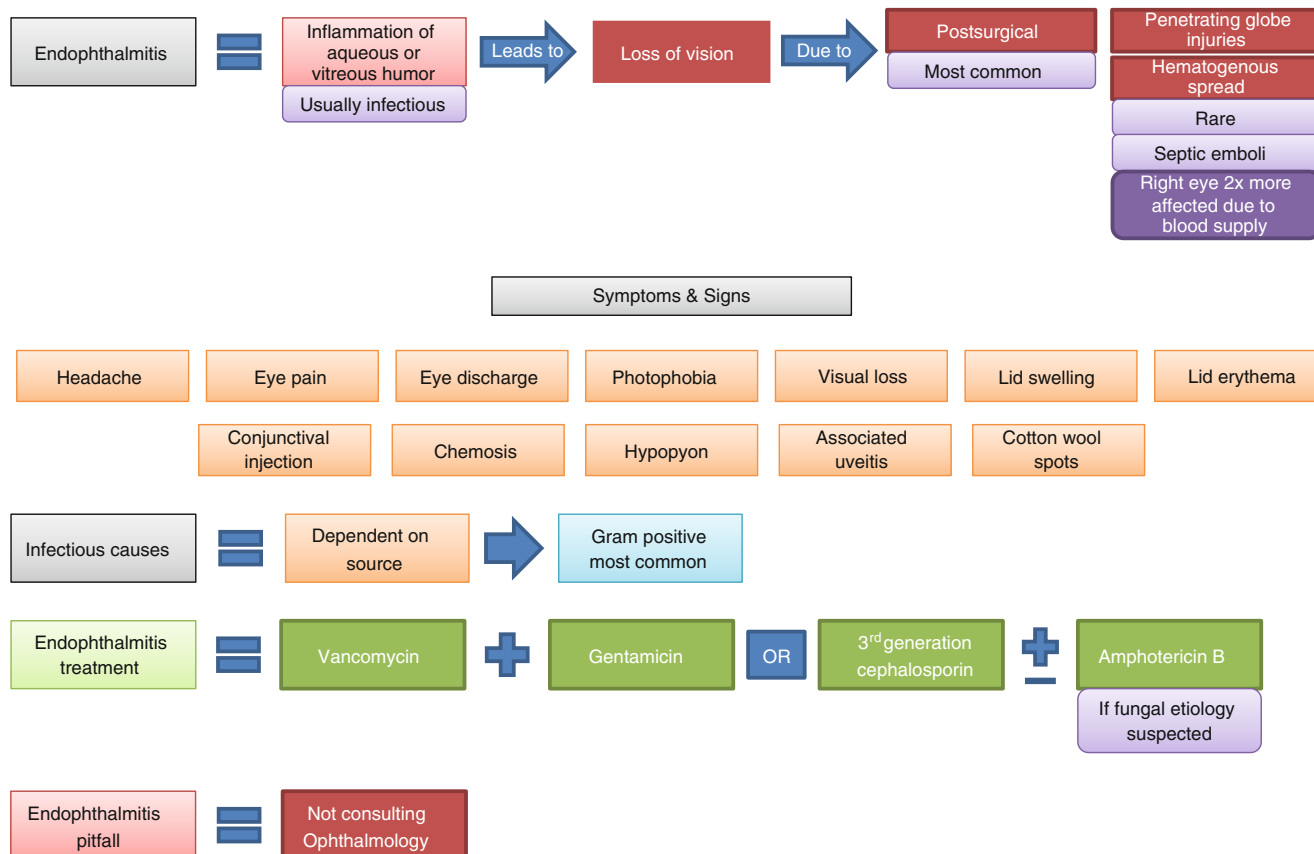


Differential Diagnosis of Iritis

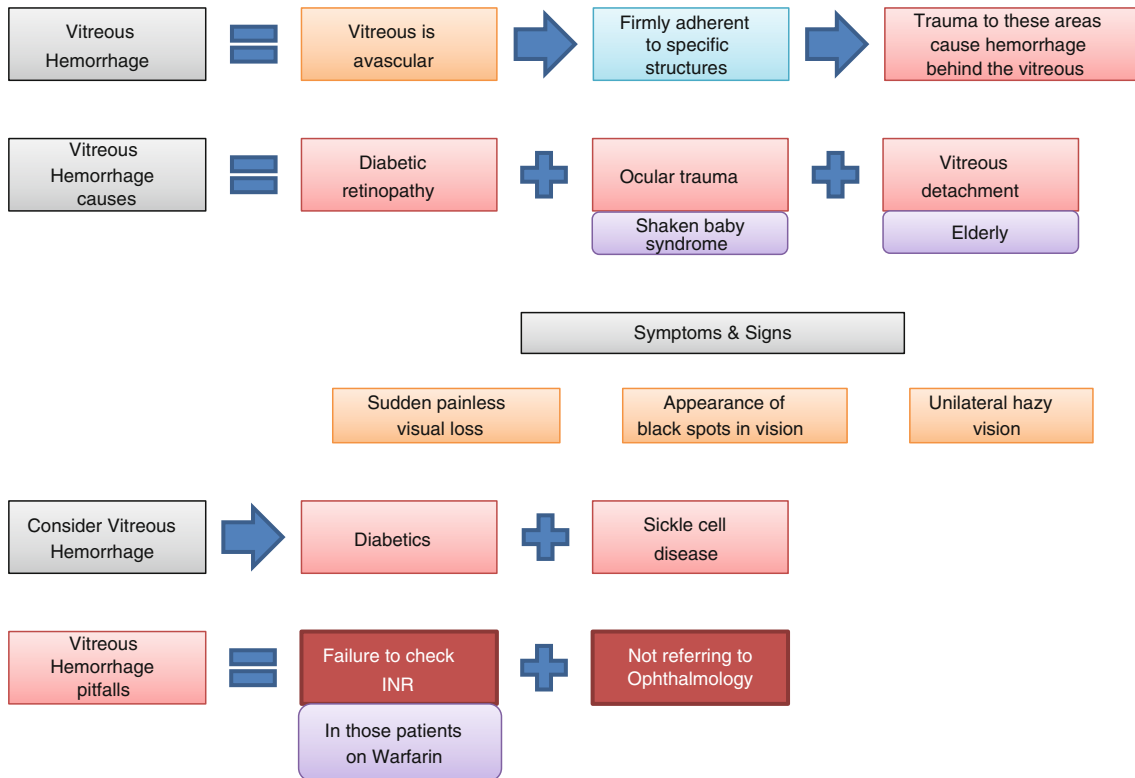


Vitreous and Intraocular Cavities

Endophthalmitis

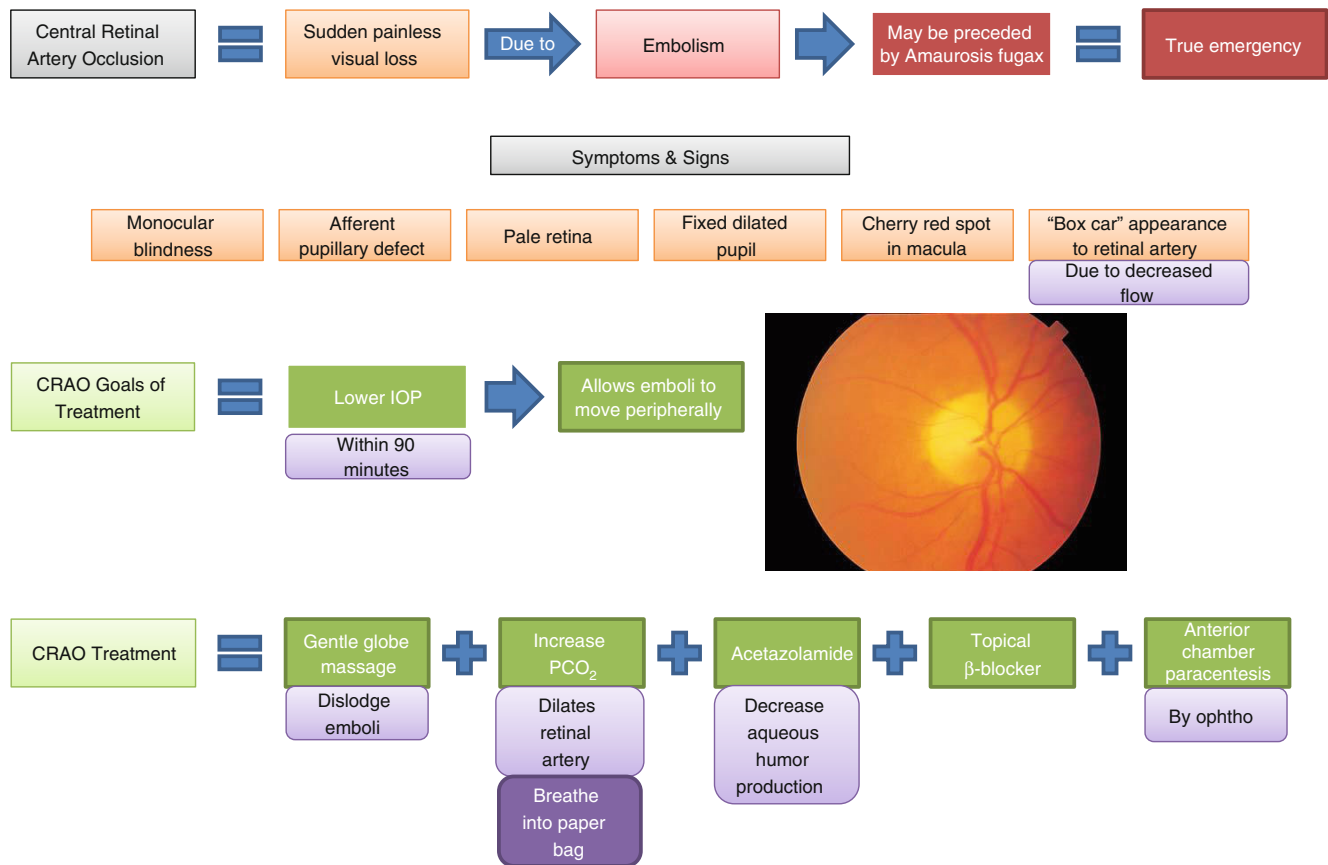


Vitreous Hemorrhage



Retina

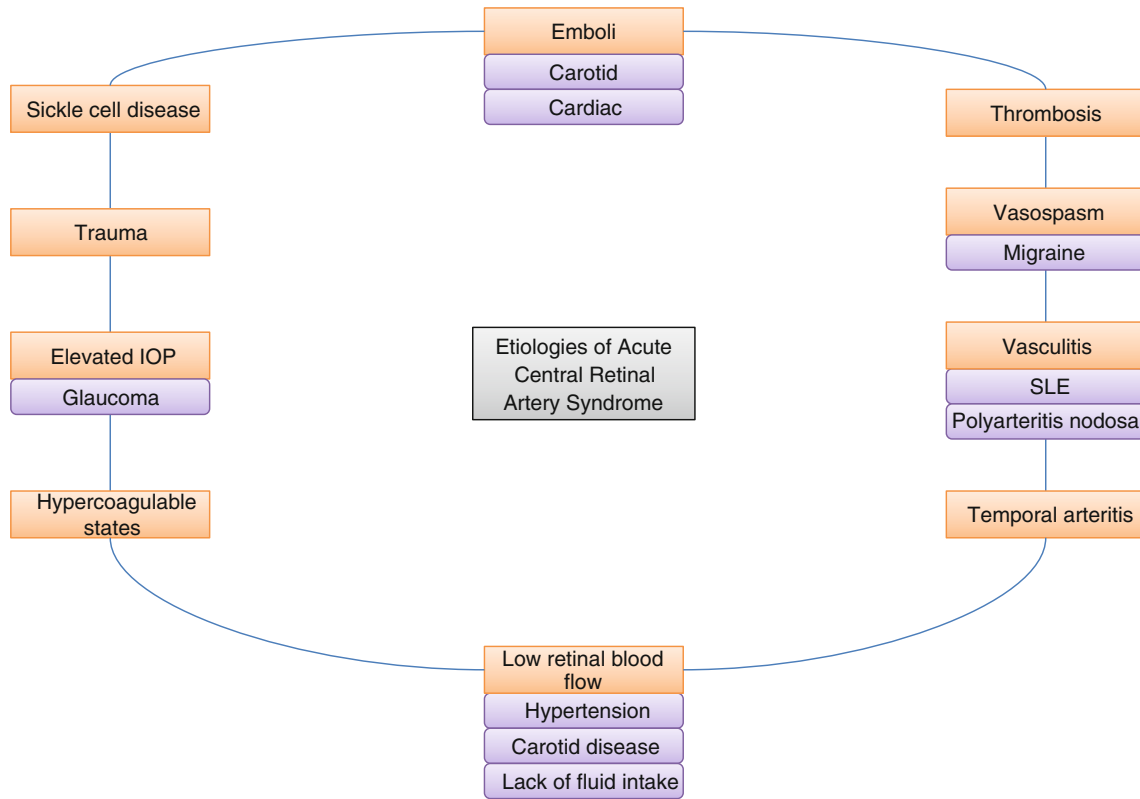
Central Retinal Artery Occlusion (CRAO)



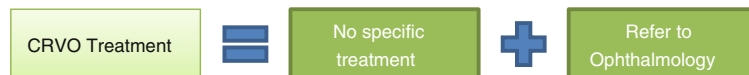
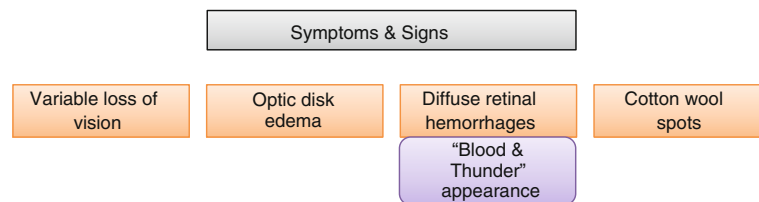
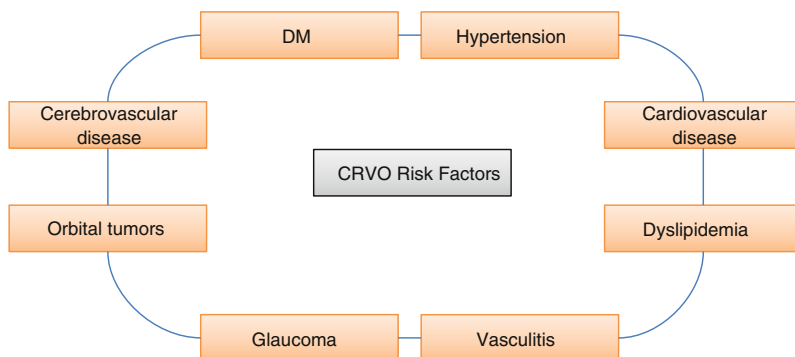
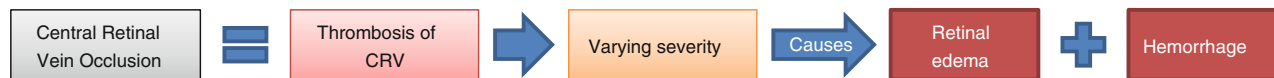
Center right image (Reprinted from Galloway NR, Amoaku WMK, Galloway PH, Browning AC. Systemic disease and the eye. In: Galloway NR, Amoaku WMK, Galloway PH, Browning AC, editors.

Common eye diseases and their management. London: Springer Verlag; 2006. p. 165–78. With permission from Springer Verlag)

Etiologies of Central Retinal Artery Syndrome



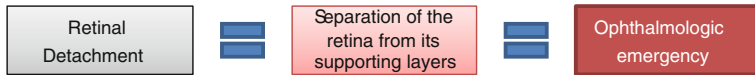
Central Retinal Vein Occlusion (CRVO)



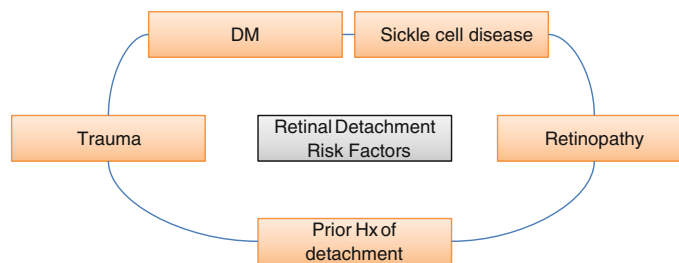
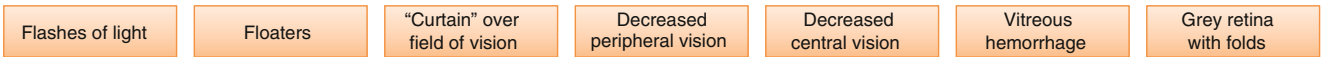
Center right image (Reprinted from Galloway NR, Amoaku WMK, Galloway PH, Browning AC. Systemic disease and the eye. In: Galloway NR, Amoaku WMK, Galloway PH, Browning AC, editors.

Common eye diseases and their management. London: Springer Verlag; 2006. p. 165–78. With permission from Springer Verlag)

Retinal Detachment

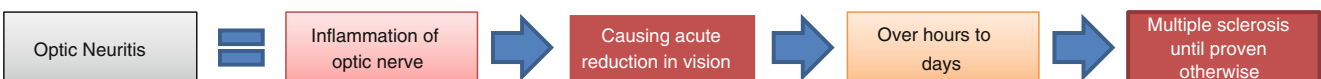


Symptoms & Signs



Optic Nerve

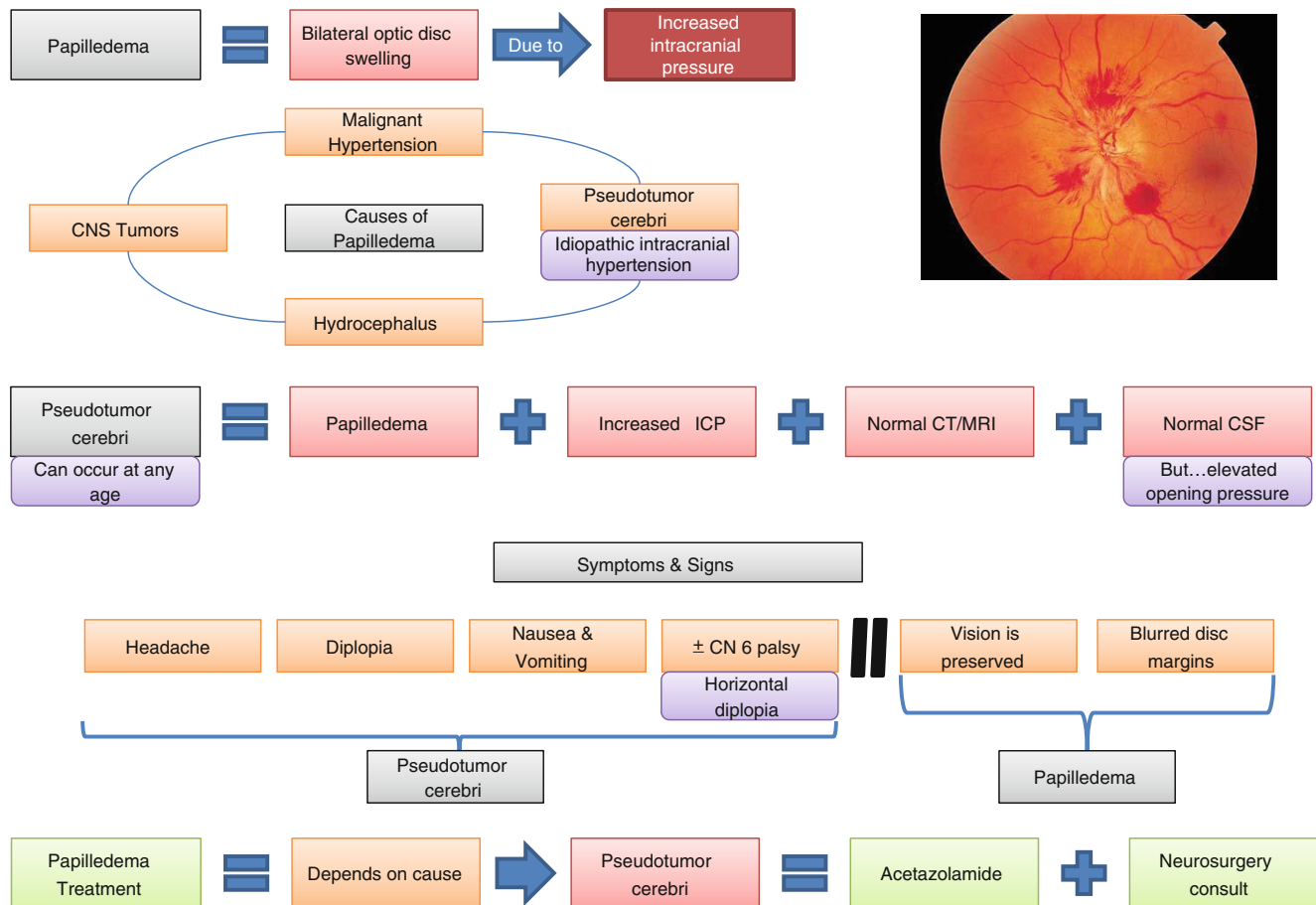
Optic Neuritis



Symptoms & Signs



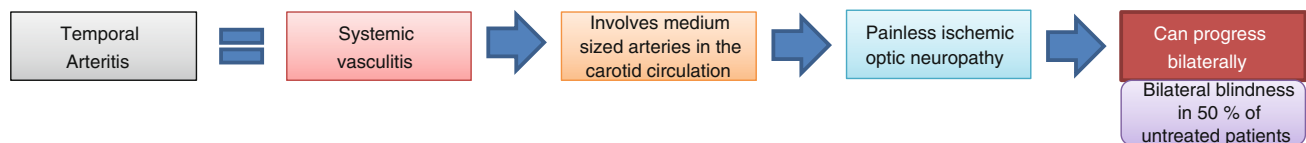
Papilledema and Pseudotumor Cerebri



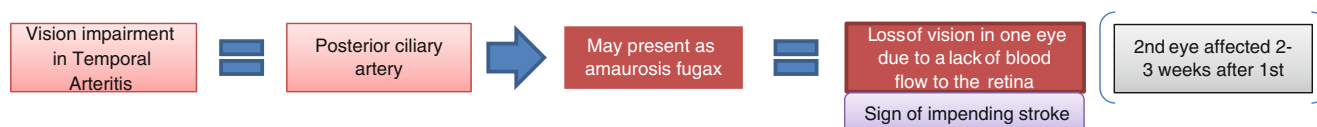
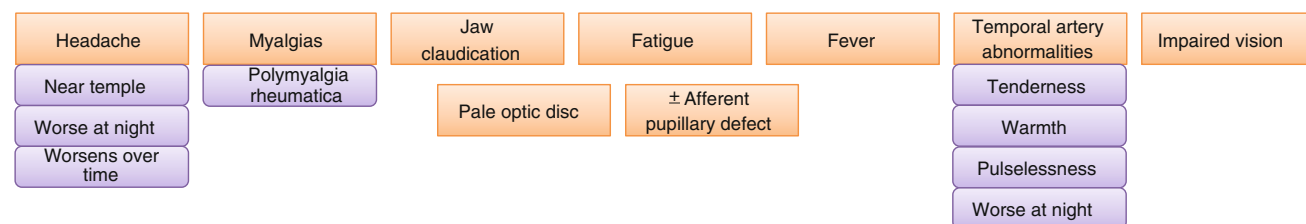
Top right image (Reprinted from Galloway NR, Amoaku WMK, Galloway PH, Browning AC. Neuro-ophthalmology. In: Galloway NR, Amoaku WMK, Galloway PH, Browning AC, editors. Common eye diseases and

their management. London: Springer Verlag; 2006. p. 179–88. With permission from Springer Verlag)

Temporal Arteritis

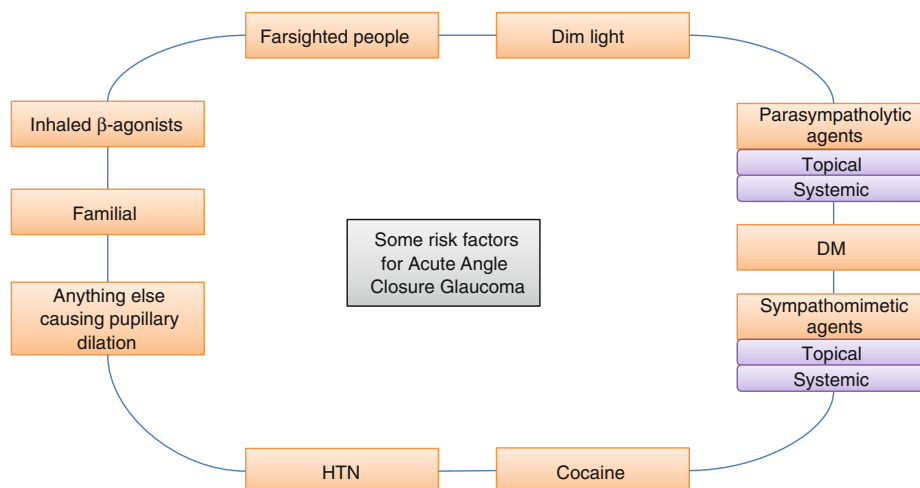
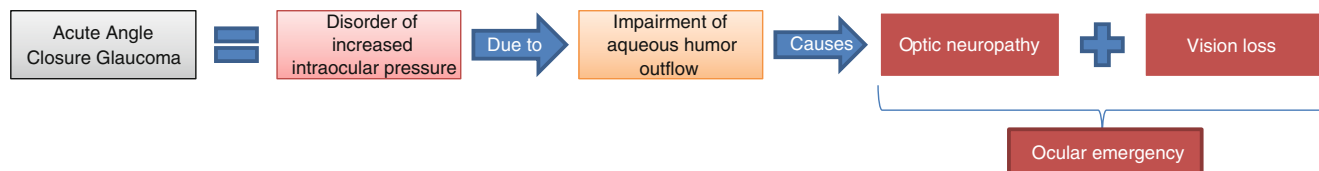


Symptoms & Signs

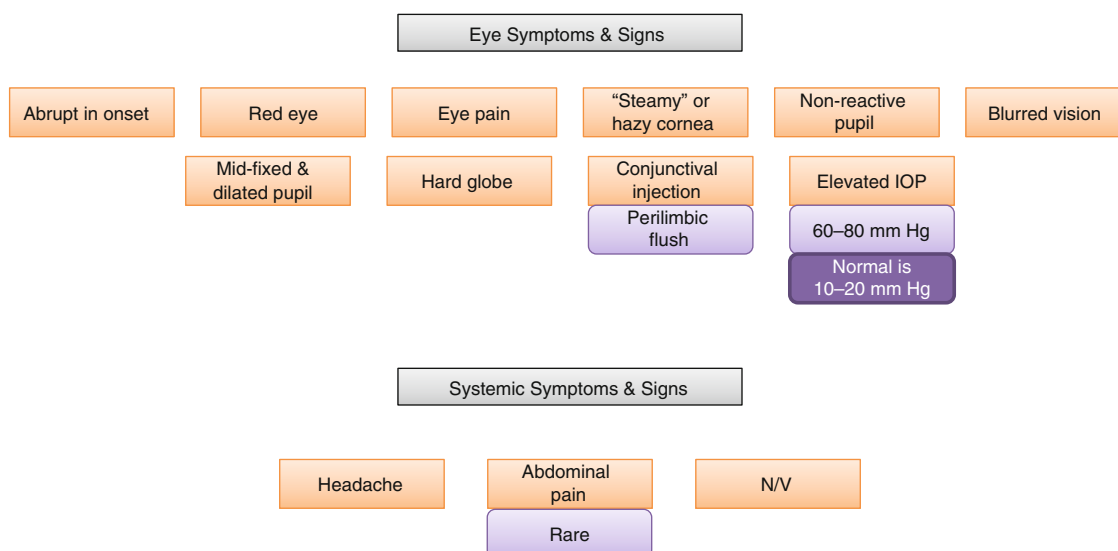


Glaucoma

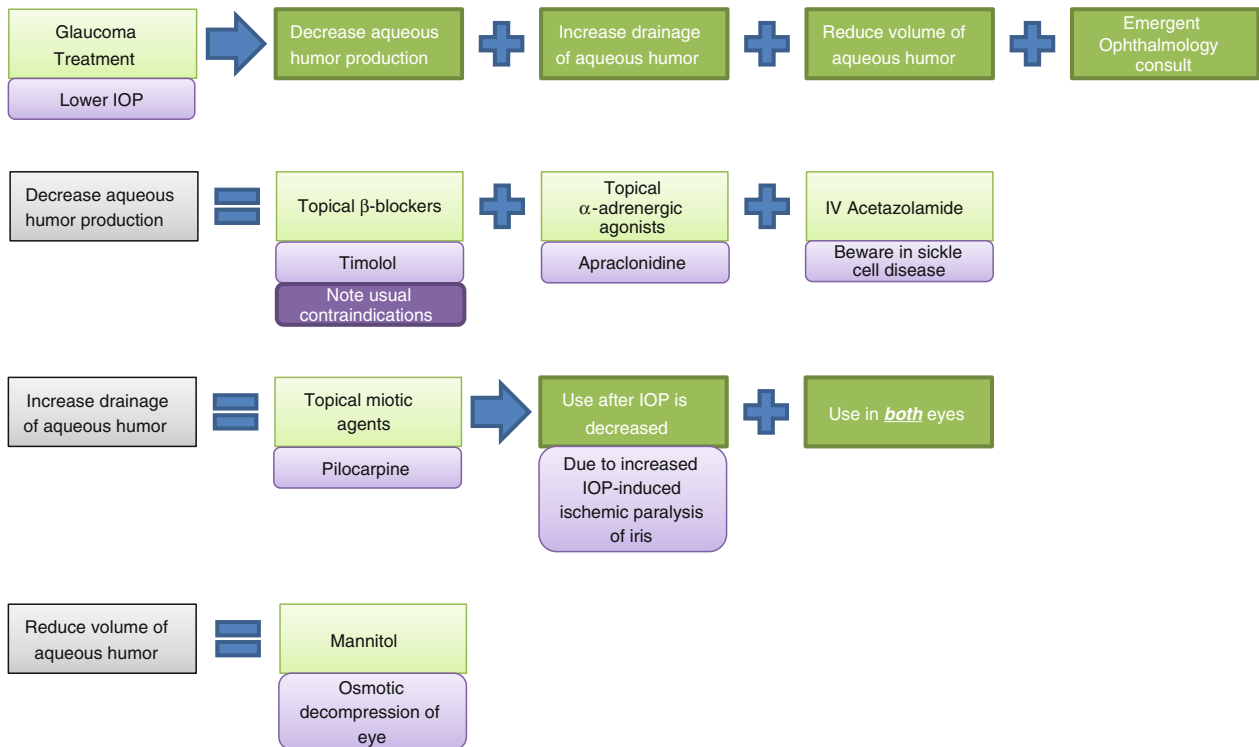
Acute Angle-Closure Glaucoma



Acute Angle-Closure Glaucoma Symptoms and Signs

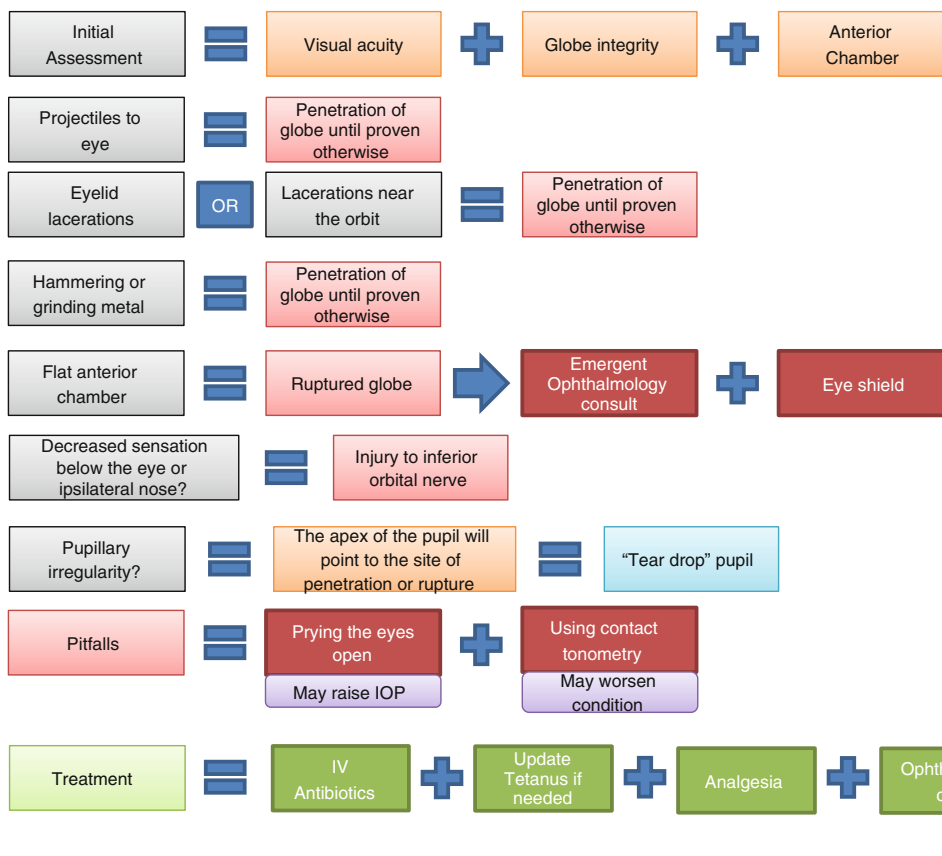


Acute Angle-Closure Glaucoma Treatment

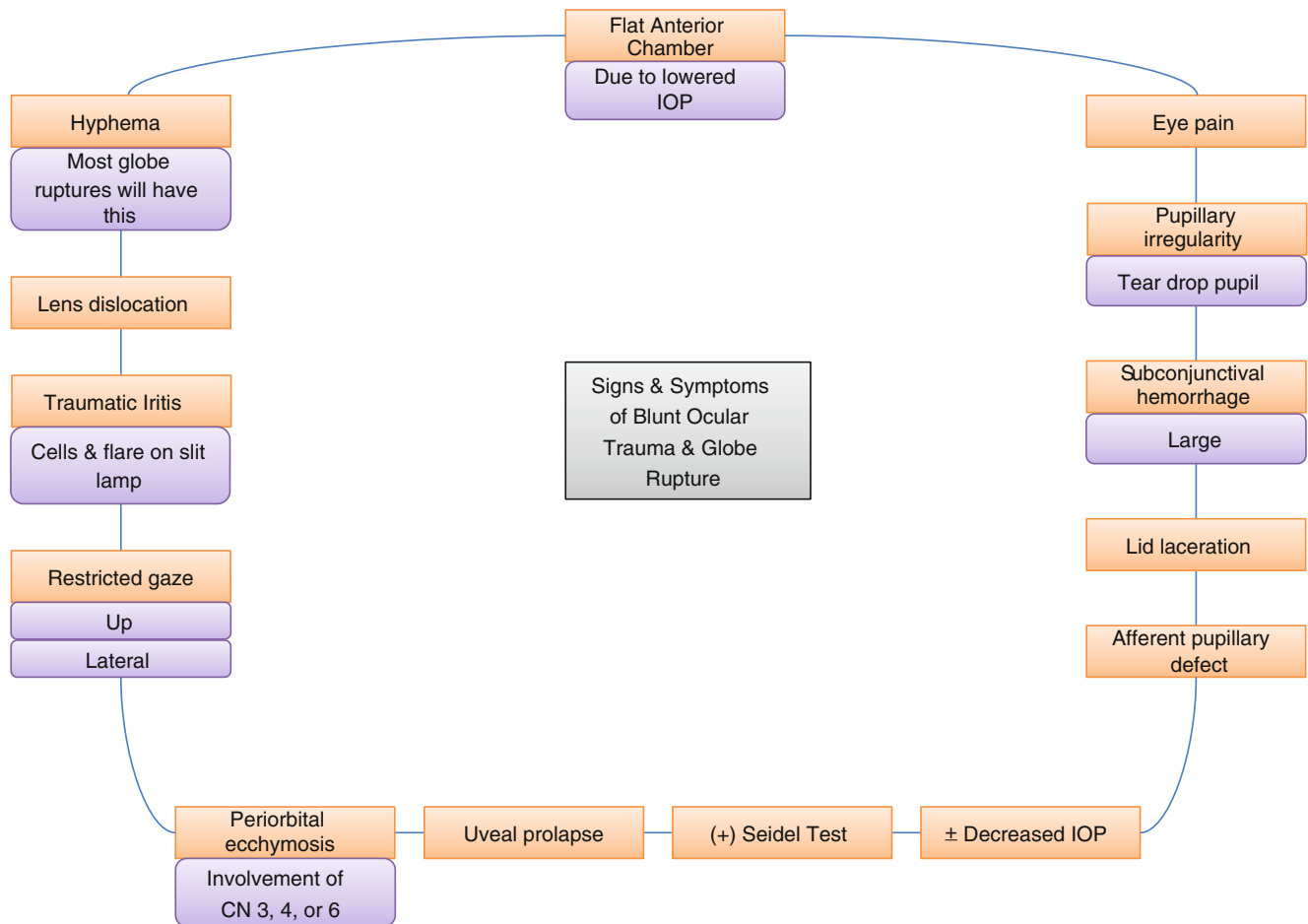


Trauma

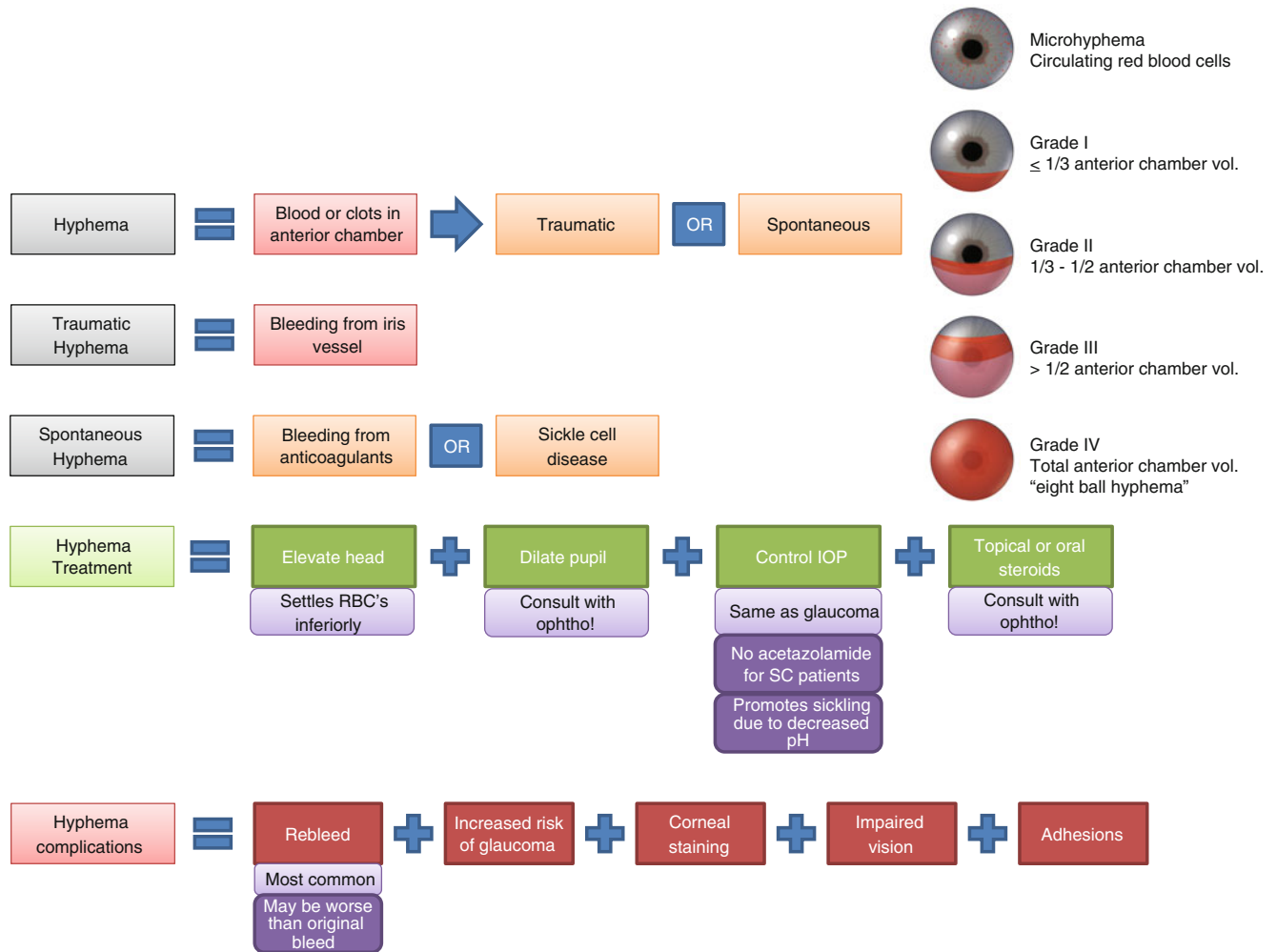
Blunt Eye Trauma



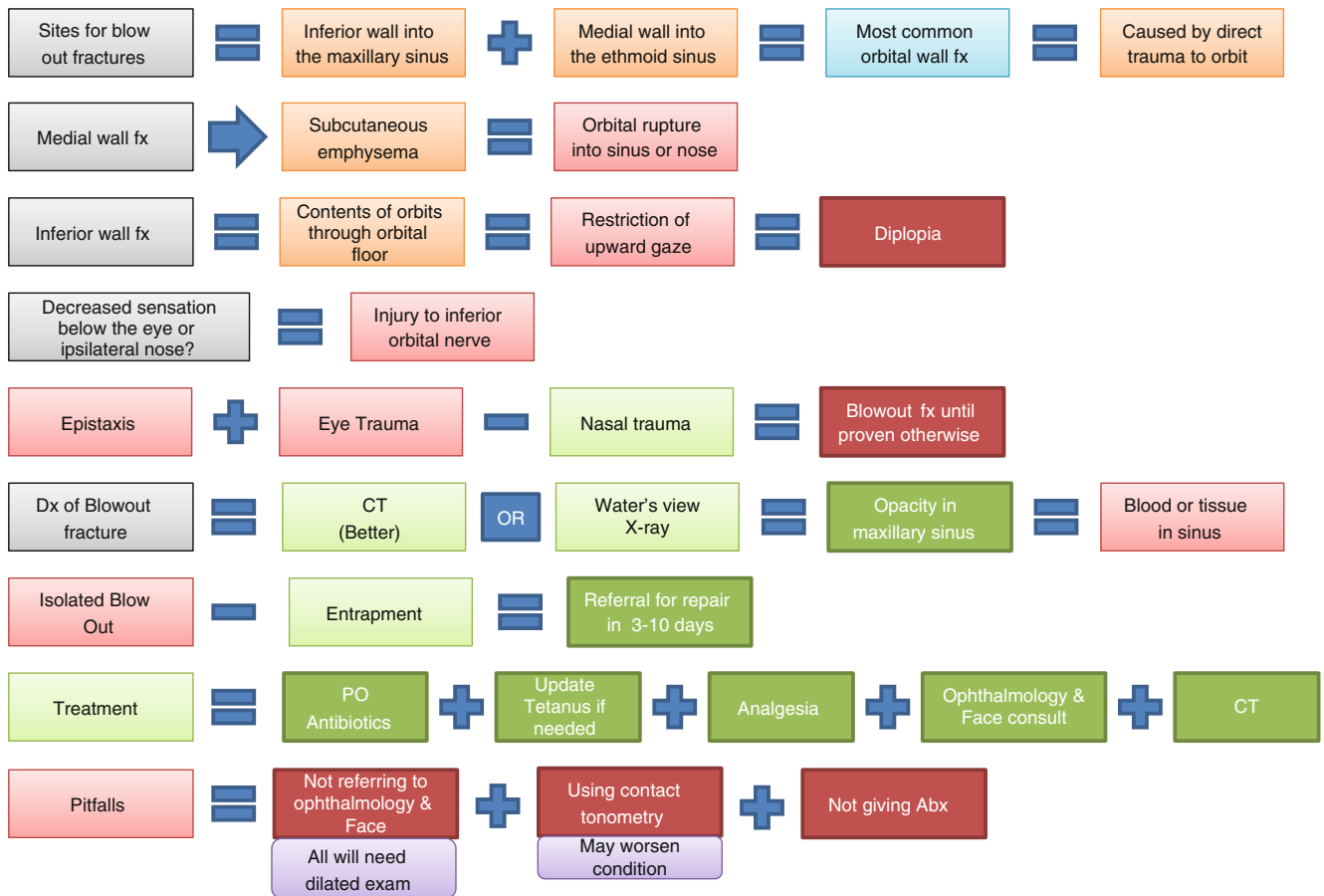
Signs and Symptoms of Blunt Ocular Trauma and Globe Rupture



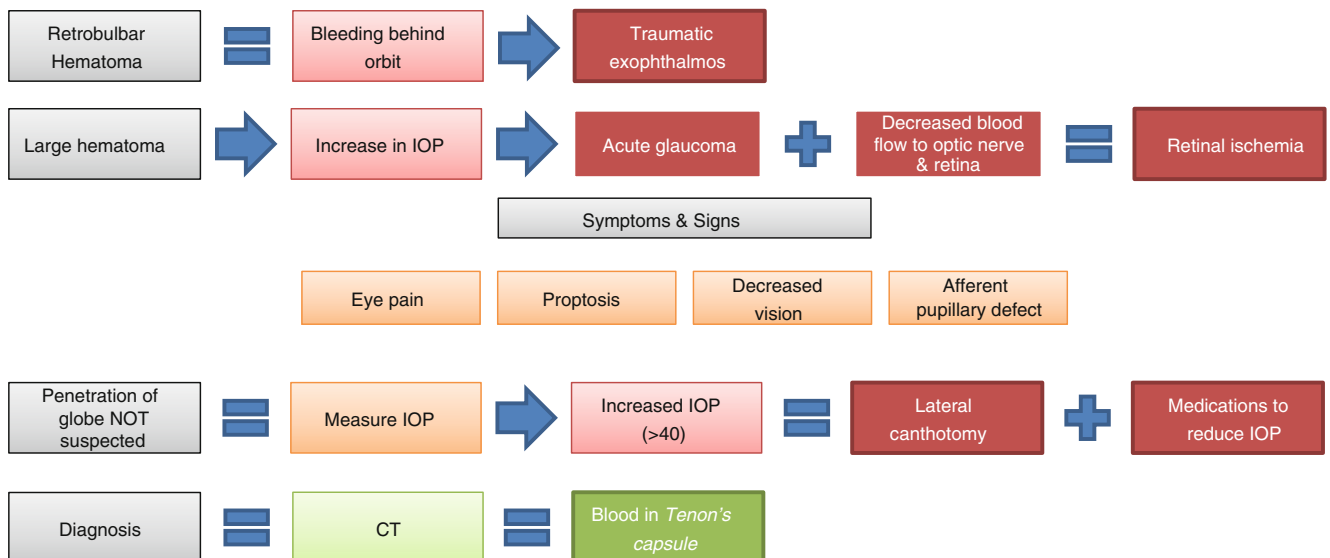
Hyphema



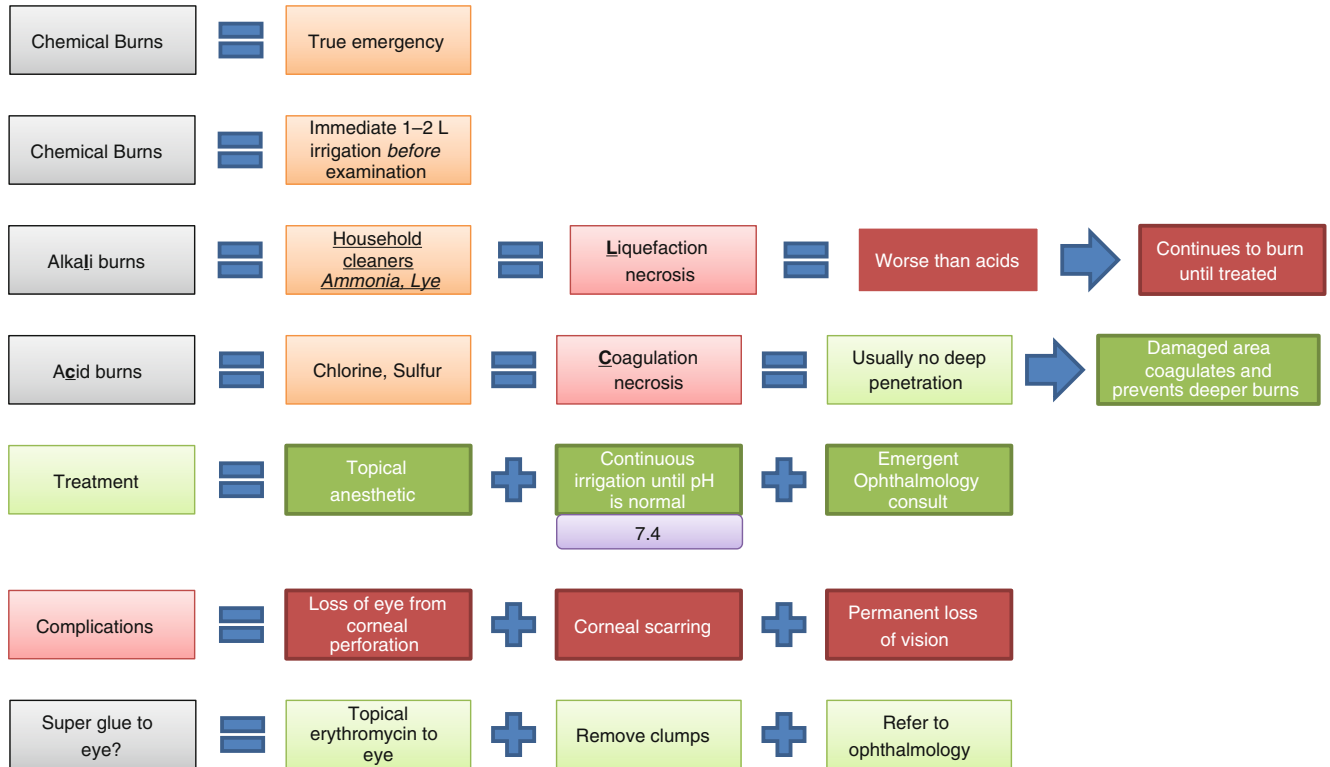
Blow-Out Fractures



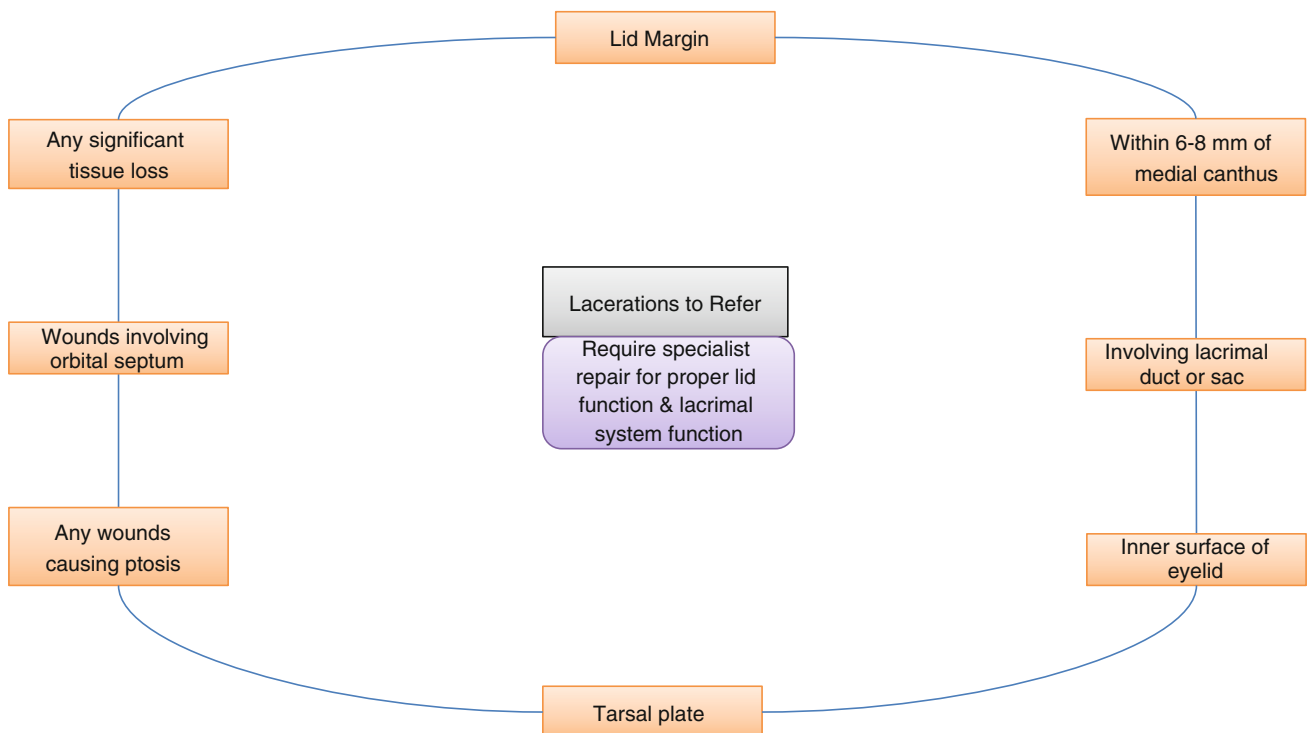
Retrobulbar Hematoma



Chemical Burns



Lacerations to Refer



Toxicologic Emergencies

Matthew Ryan and Bobby Desai

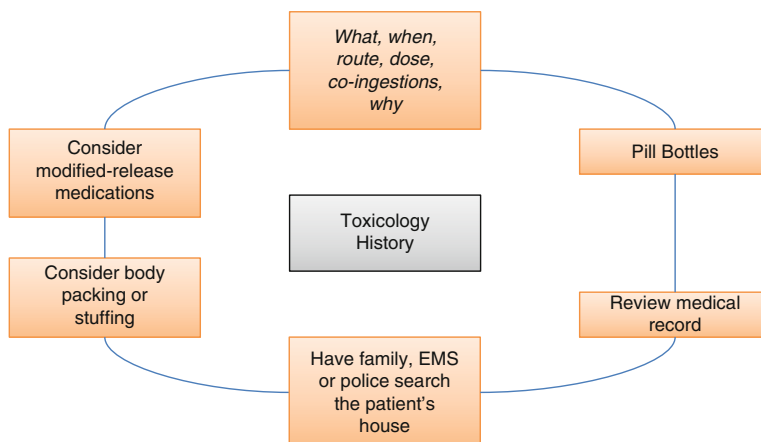
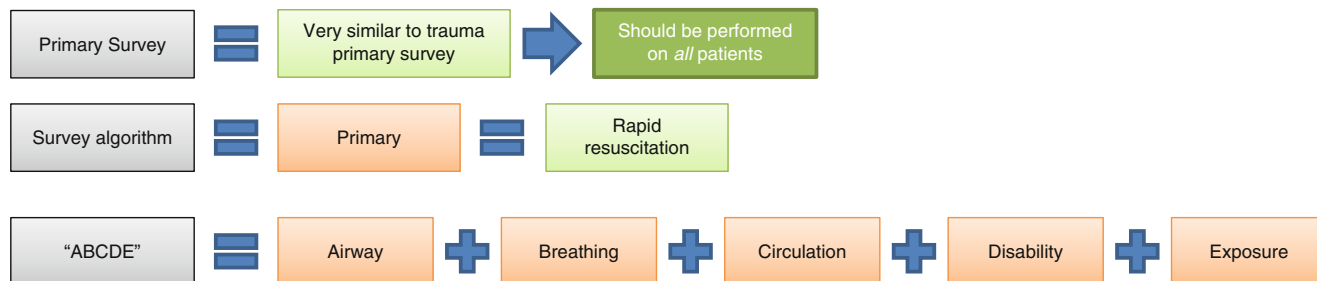
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Specific Toxins and Poisons.....	692

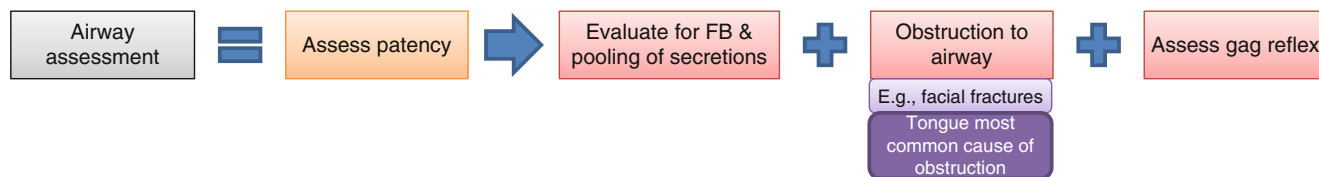
M. Ryan, MD, PhD • B. Desai, MD, MEd
Department of Emergency Medicine, University of Florida,
Gainesville, FL, USA
e-mail: bdesai@ufl.edu

General Approach to the Poisoned Patient

Primary Survey



Airway Assessment



Breathing Assessment



Circulation Assessment



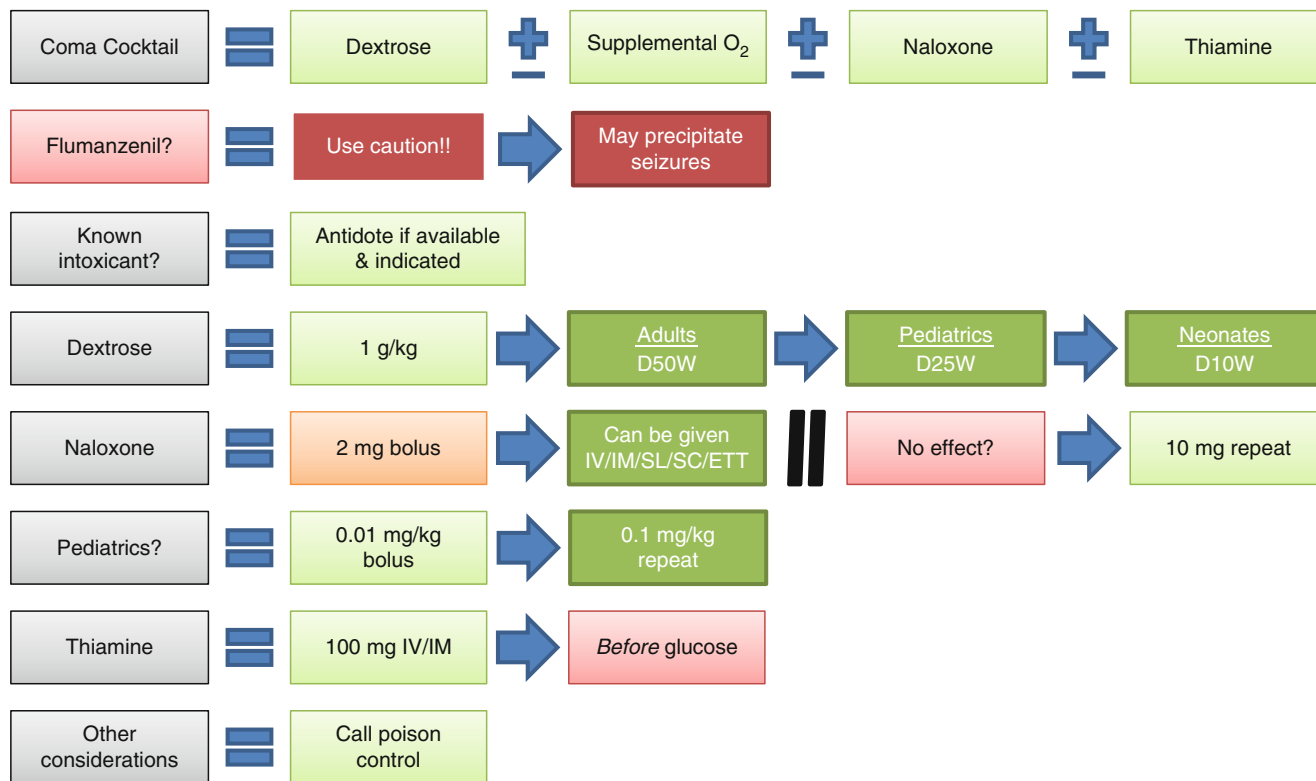
Disability Assessment



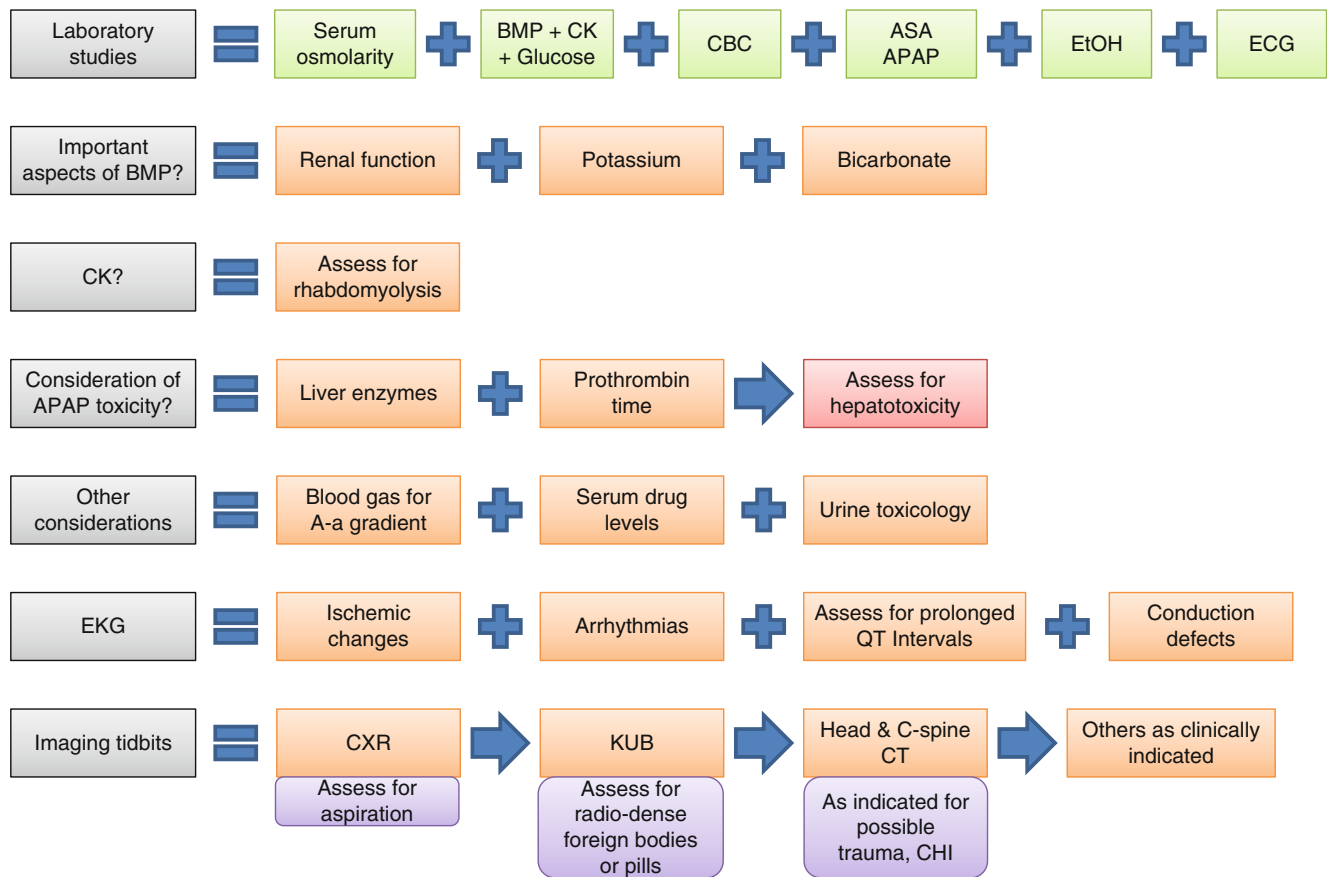
Exposure



Primary Survey Adjuncts



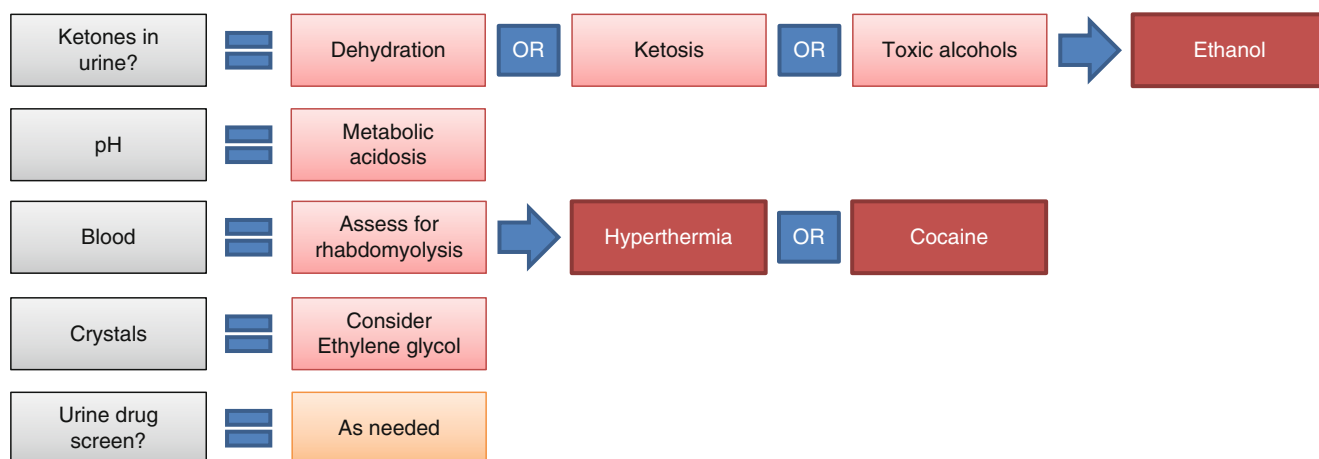
Laboratory Studies



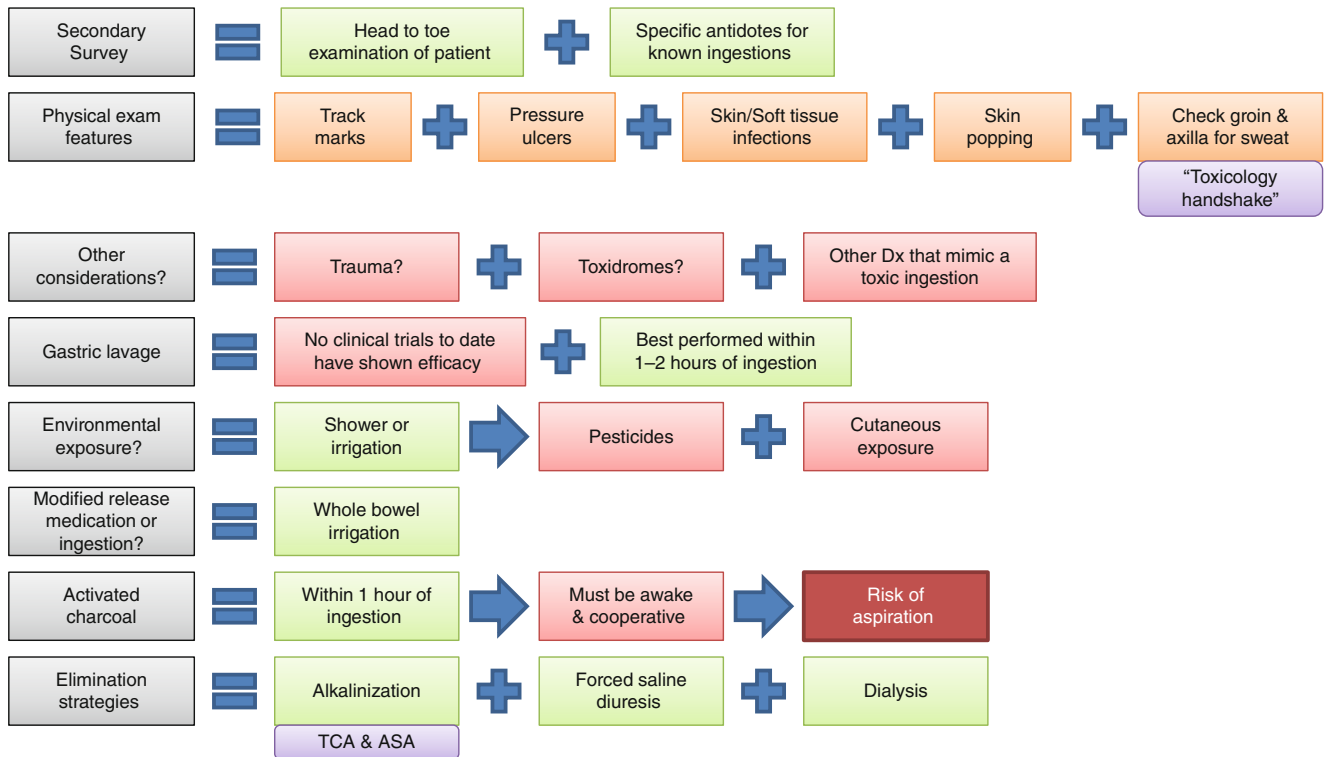
Toxicology Screens



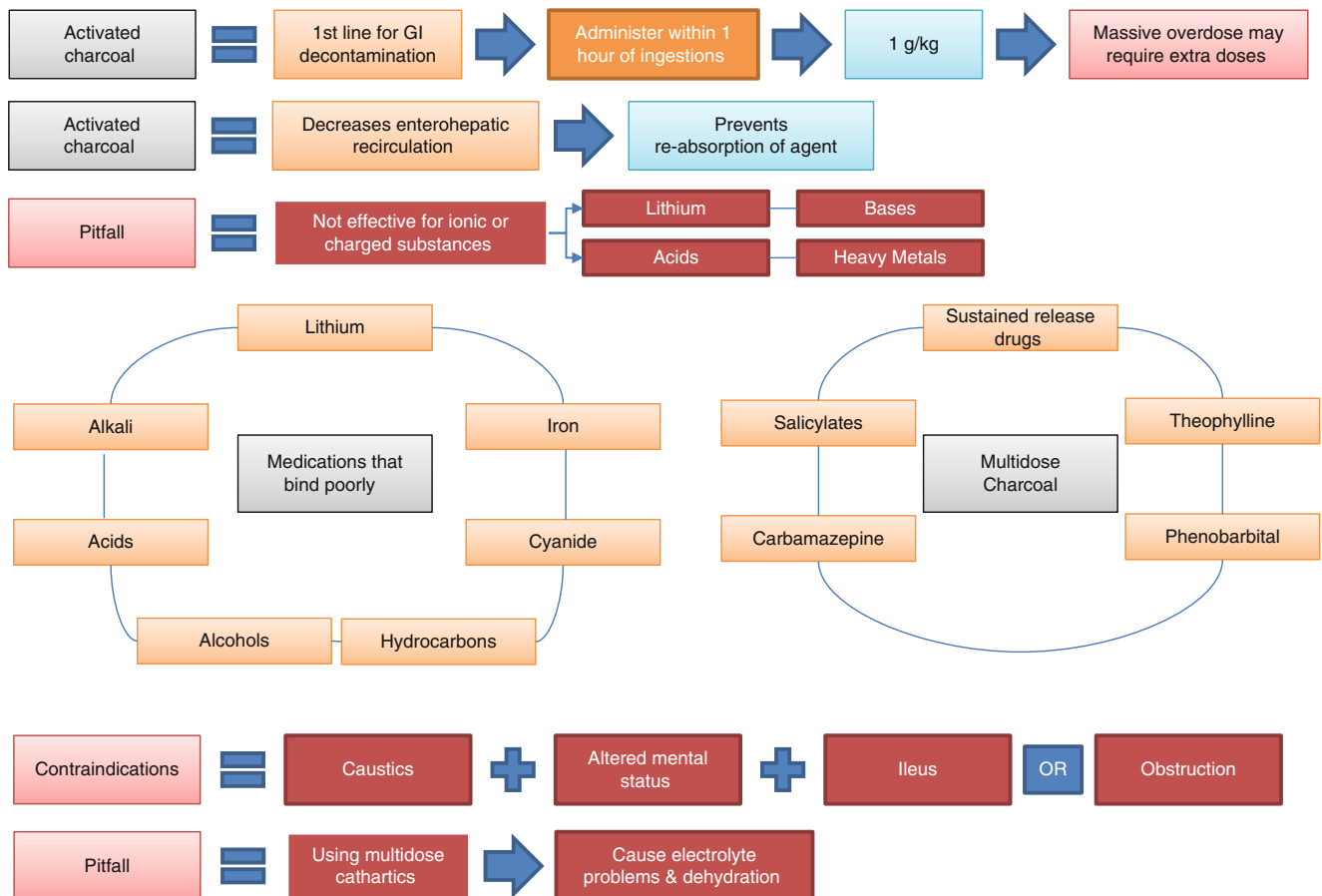
Urinalysis Tidbits



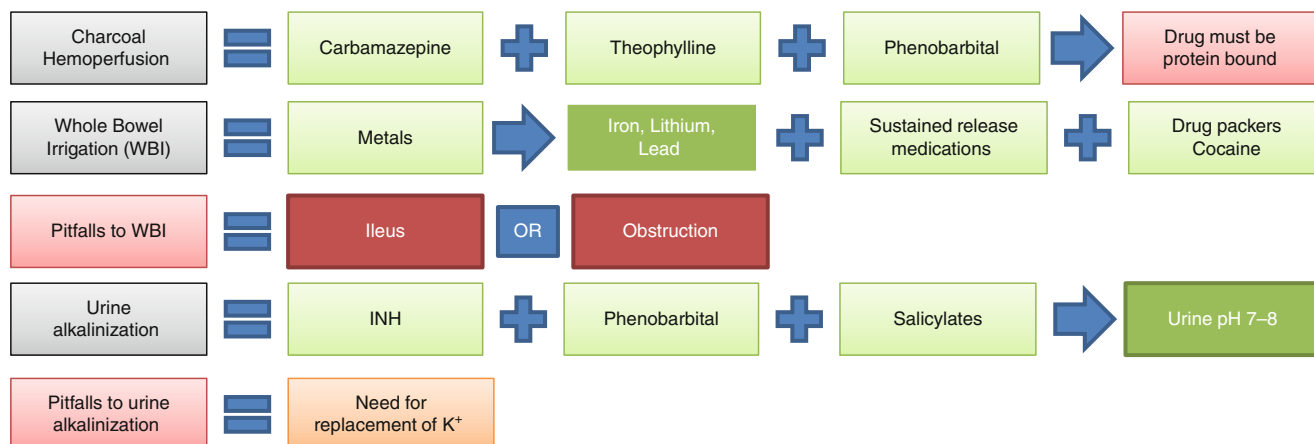
Secondary Survey and Adjuncts



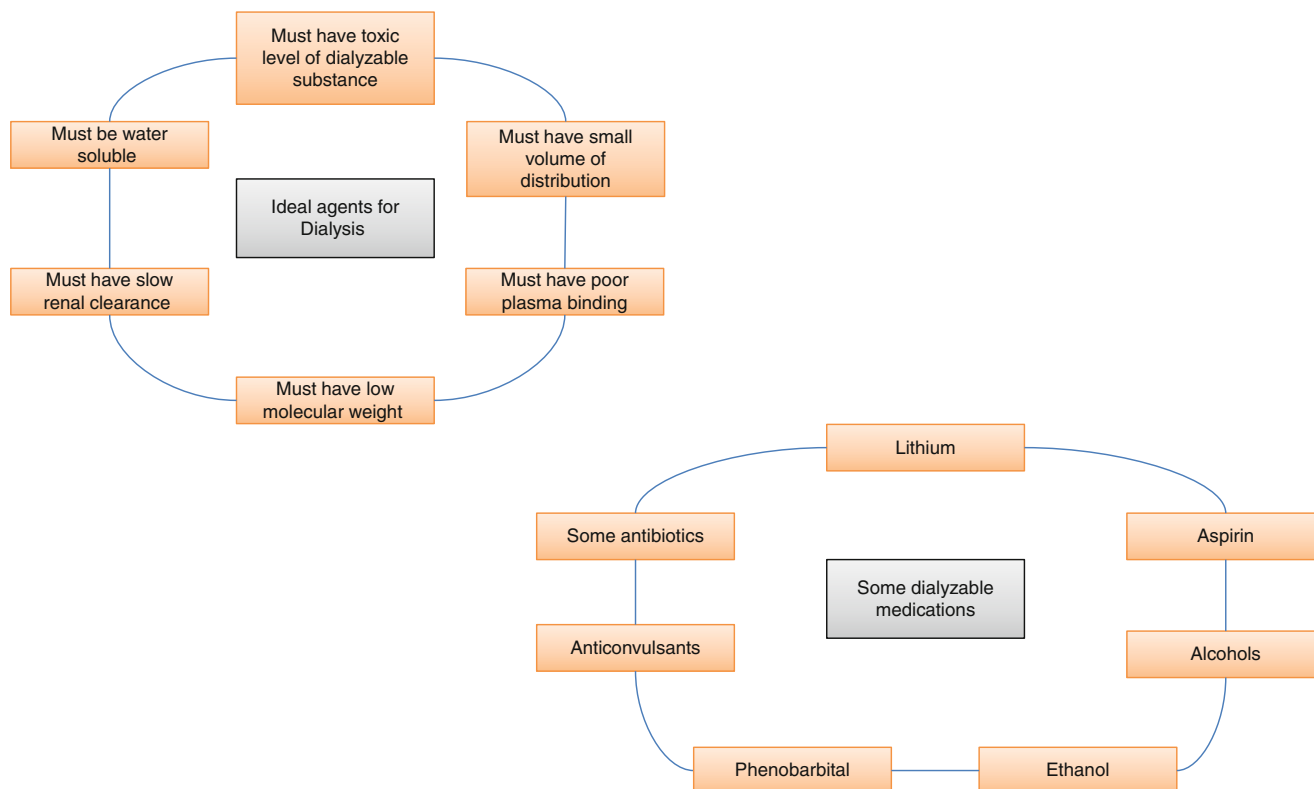
Charcoal Tidbits

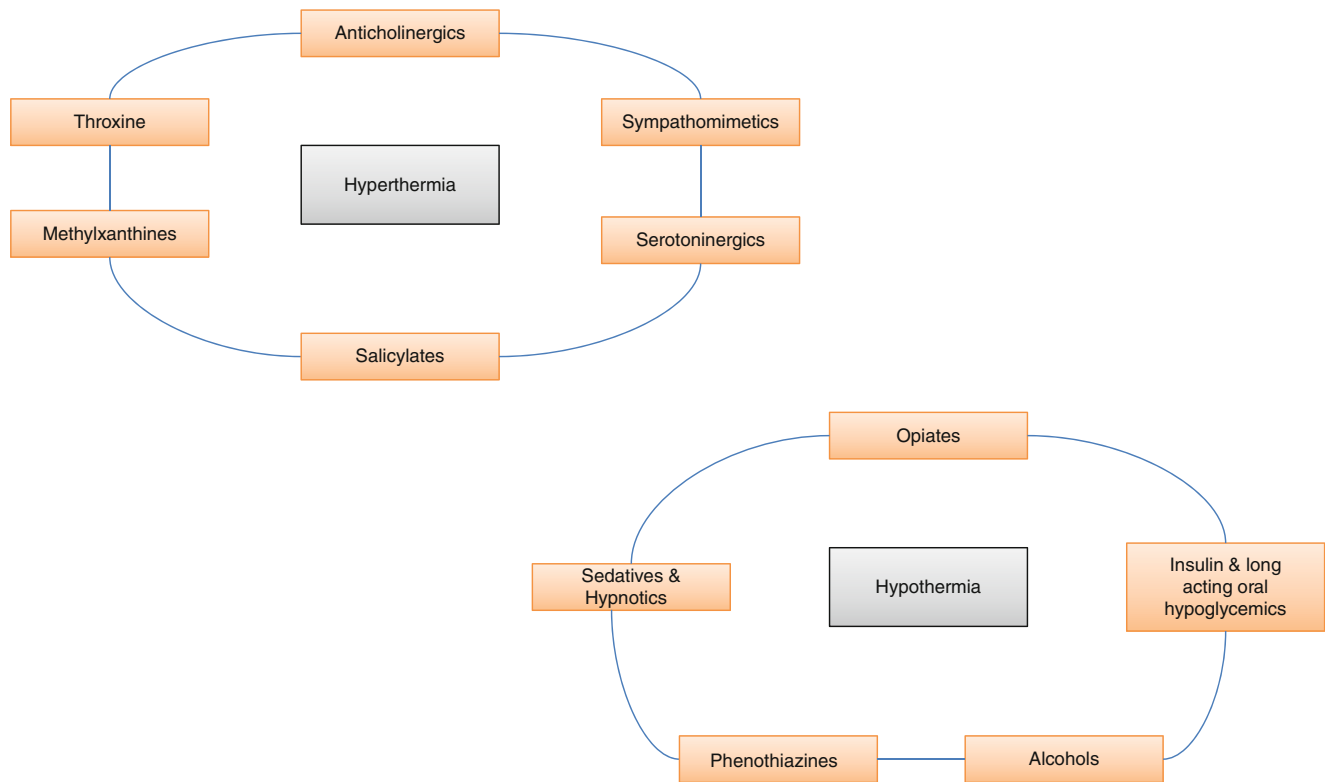
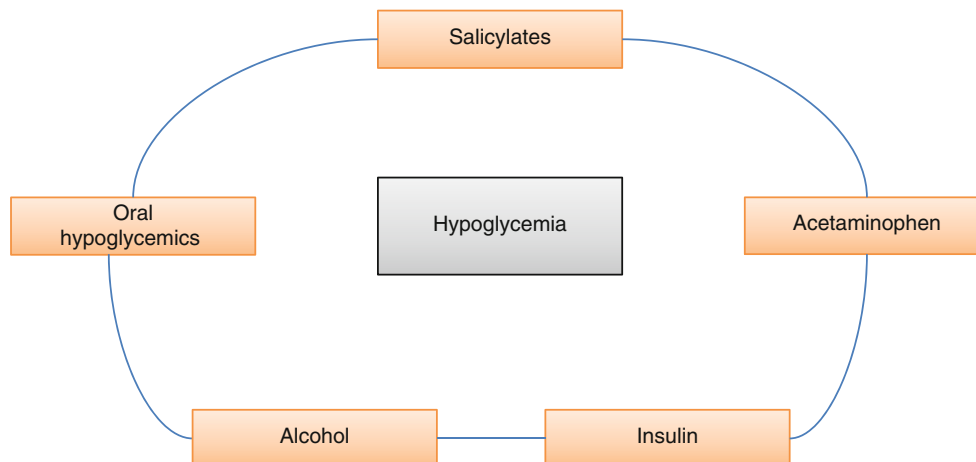


Other Methods of Drug Elimination



Dialysis Tidbits



Toxins That Alter Thermoregulation or Cause Temperature Changes**Toxins That Cause Hypoglycemia**

Select Antidotes

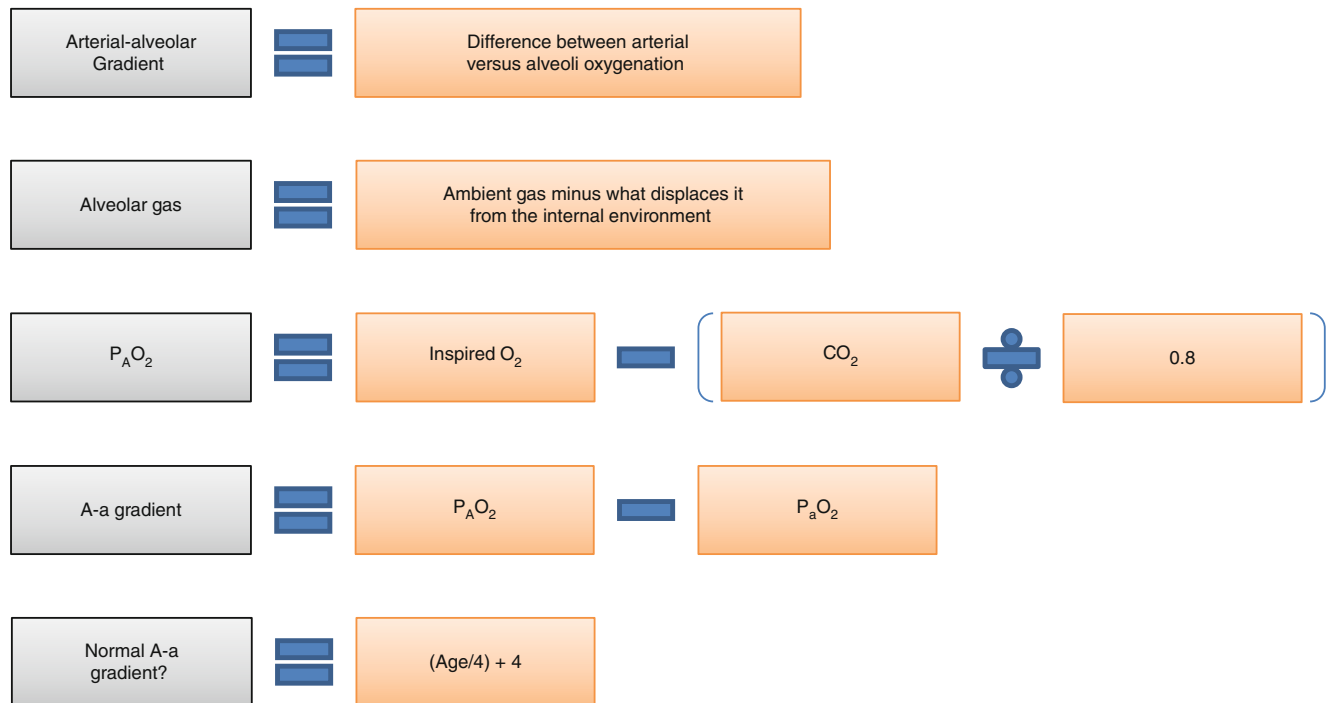
Agent/ Drug	Antidote
Acetaminophen	N-Acetylcysteine
Anticholinesterase	Atropine/Pralidoxime
Anticholinergics	Physostigmine
Benzodiazepines	Flumazenil
β -blockers	Glucagon
Calcium-channel blockers	Glucagon
Coumadin	Phytonadione
Cyanide	Amyl nitrate, Sodium nitrite, Sodium thiosulfate or Hydroxocobalamin
Digoxin	Digibind
Extrapyramidal symptoms	Diphenhydramine
Ethylene glycol	Fomepizole
Heparin	Protamine sulfate
Insulin reaction	Glucose
Iron	Deferoxamine
Lead	Dimercapol, EDTA
Narcotics	Naloxone
TCA's	Sodium bicarbonate

Overdose Odor Pearls

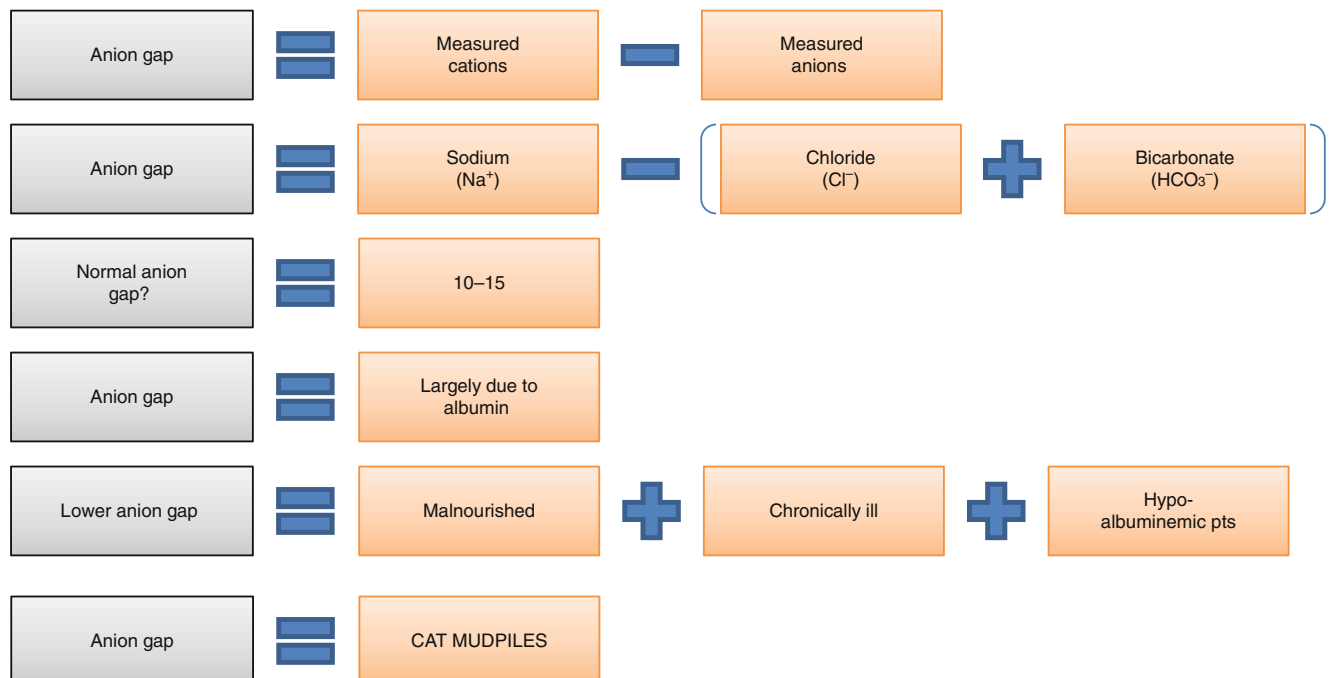
Odor	Agent
Burnt Almonds	Cyanide
Carrots	Water Hemlock
Fruity breath	Ethanol, Acetone, Isopropanol, Hydrocarbons
Garlic	Arsenic, arsenates
Glue	Toluene, Benzene, Polyaromatic hydrocarbons & other solvents
Pears	Chloral hydrate, Paraldehyde
Rotten eggs	Hydrogen Disulfide
Wintergreen	Topical Salicylate, e.g., Methyl Salicylate

Data Interpretation

Arterial-Alveolar Gradient



Anion Gap



Toxins Associated with Anion Gap

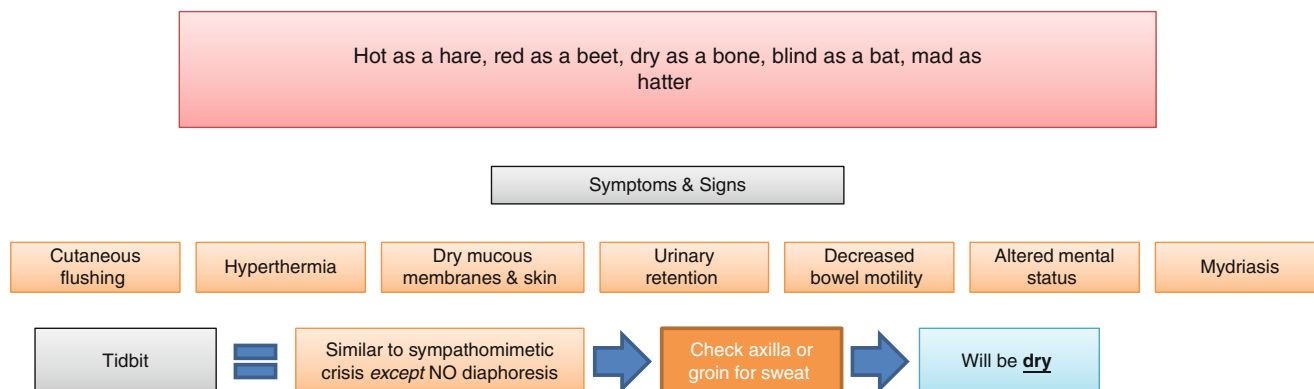
Toxins	Tidbits
<u>C</u> O/ <u>C</u> N	Inhibits oxidative phosphorylation
Ethanol (<u>A</u> lcohol)	Acidosis, Respiratory depression, Dehydration
<u>T</u> oluene	
<u>M</u> ethanol	Formic acid
<u>U</u> remia	
<u>D</u> iabetic Ketoacidosis	
<u>P</u> araldehyde	Acetic and Chloracetic acid
<u>I</u> soniazid	Lactic acidosis
<u>I</u> ron	Inhibits oxidative phosphorylation
<u>L</u> actic acidosis	Sepsis
<u>E</u> thylene glycol	Oxalic acid
<u>S</u> alicylates	Acidosis & Inhibits oxidative phosphorylation

Osmolar Gap

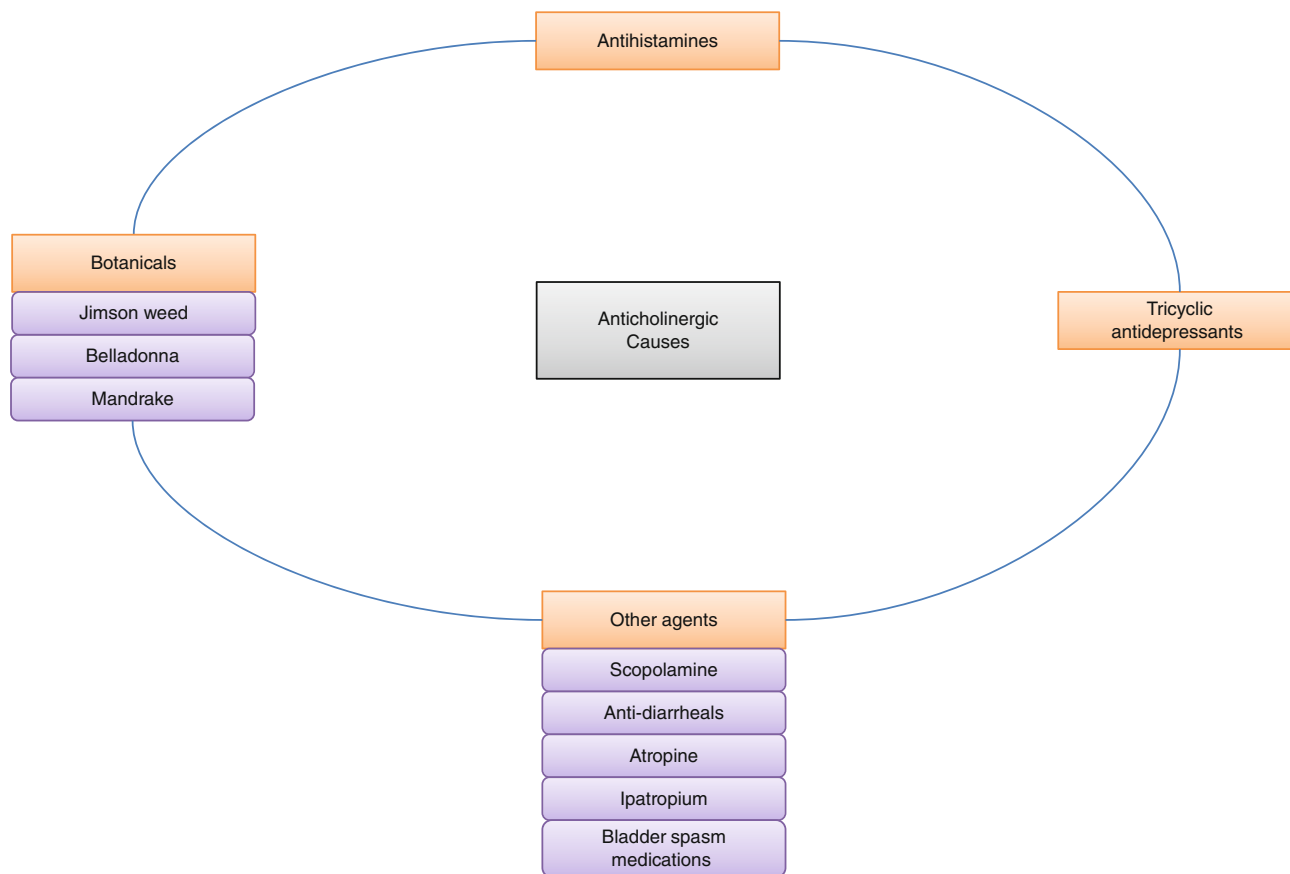
Osmolar Gap	=	Measured osmolality	-	Calculated osmolality						
Normal osmolar gap?	=	-15 up to +10 (mean +2)	➡	Usually < 10						
Normal gap due to ?	=	Calcium	+	Lipids	+	Proteins				
Differential diagnosis of osmolar gap	=	Increased protein	OR	Alcohols	OR	Hyperglycemia	OR	Ketosis	OR	Acidosis
Presence of osmolar gap?	=	Consider toxic alcohols	OR	AKA	OR	DKA	OR	Mannitol		
Most common cause of gap?	=	Ethanol								

Toxidromes

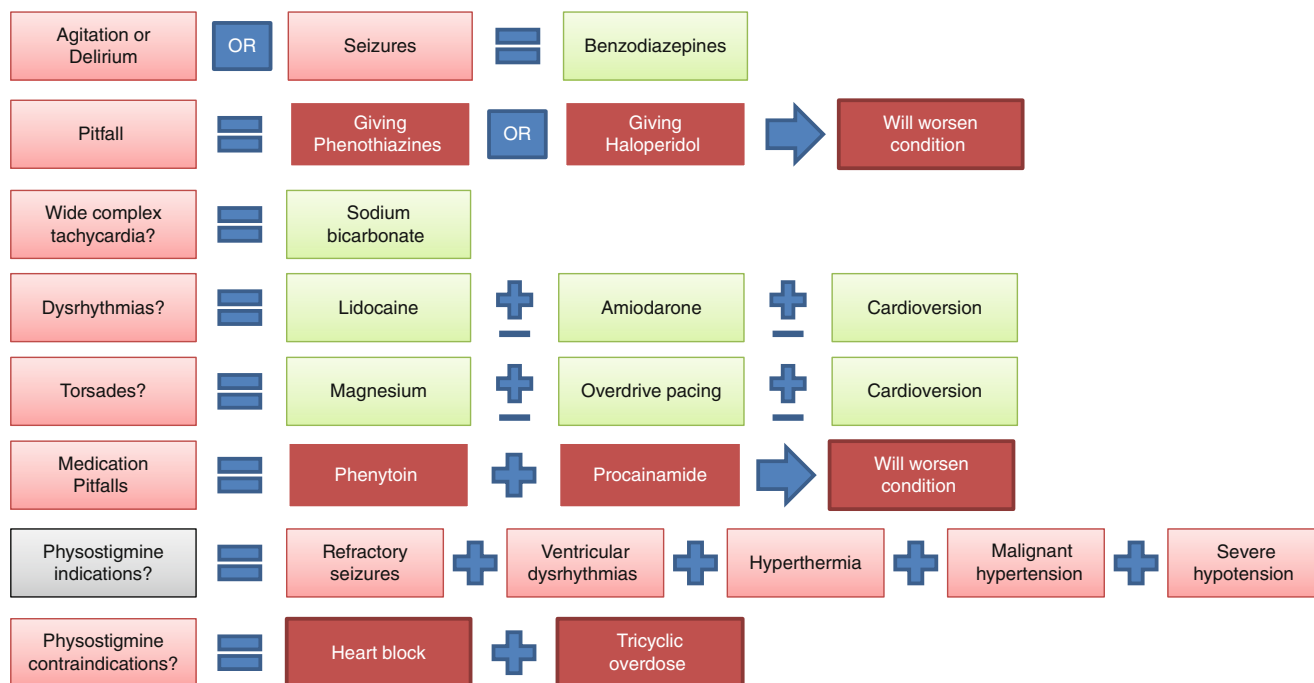
Anticholinergic Toxidrome



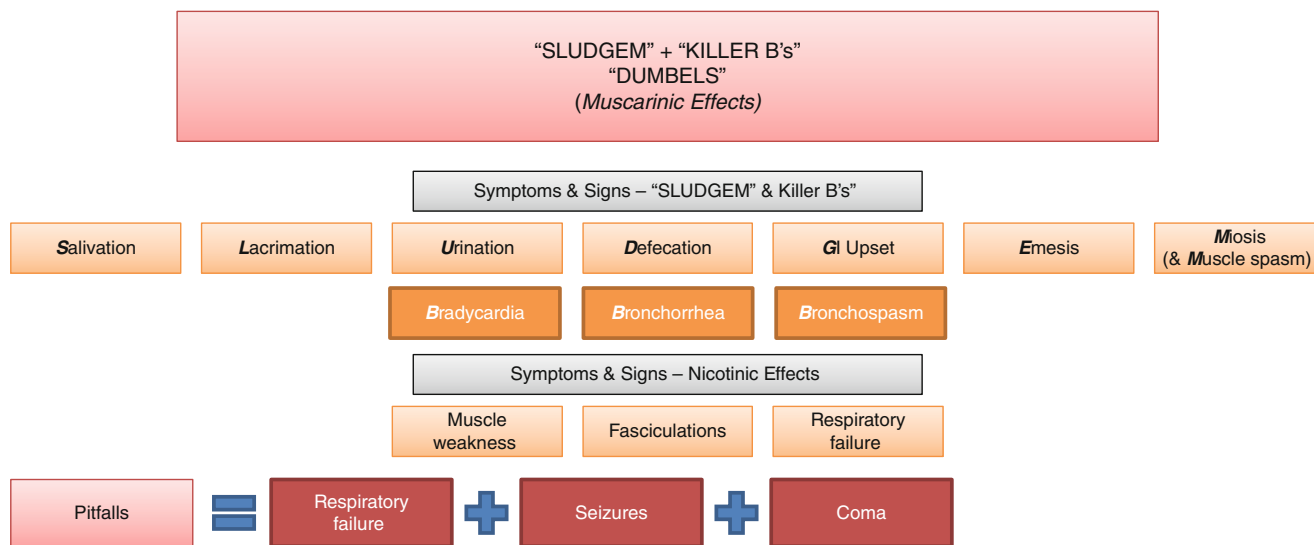
Anticholinergic Causes



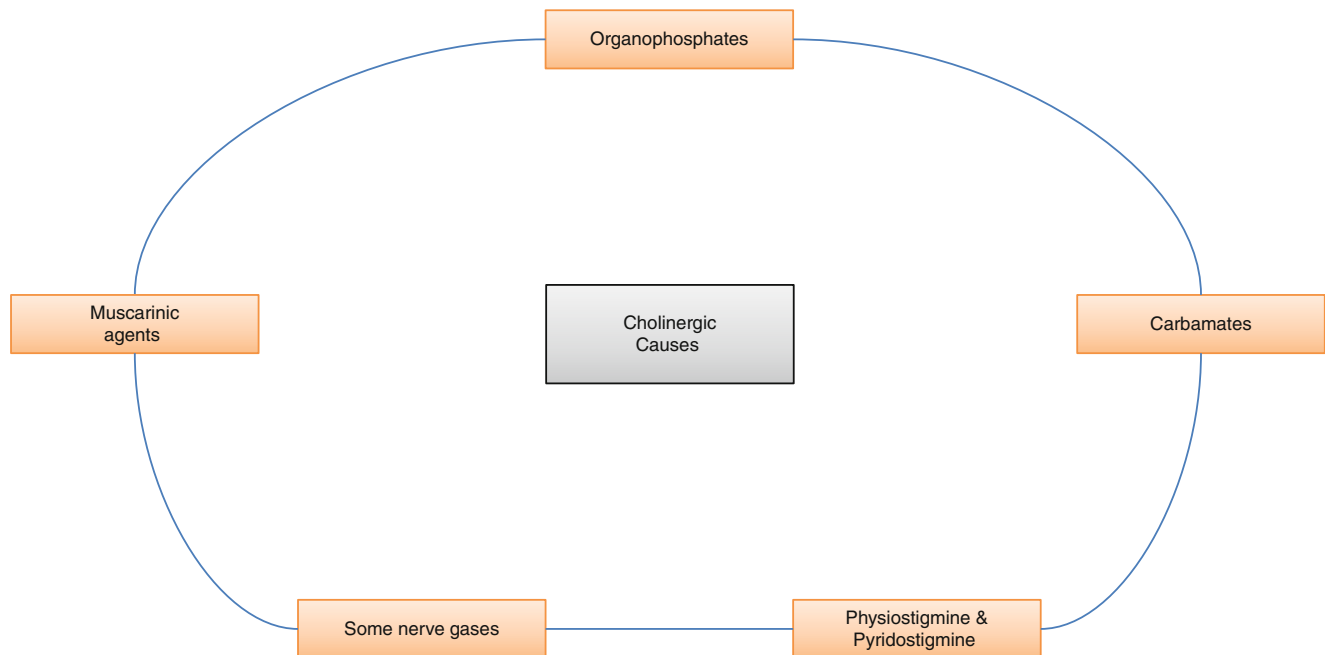
Anticholinergic Treatment Tidbits



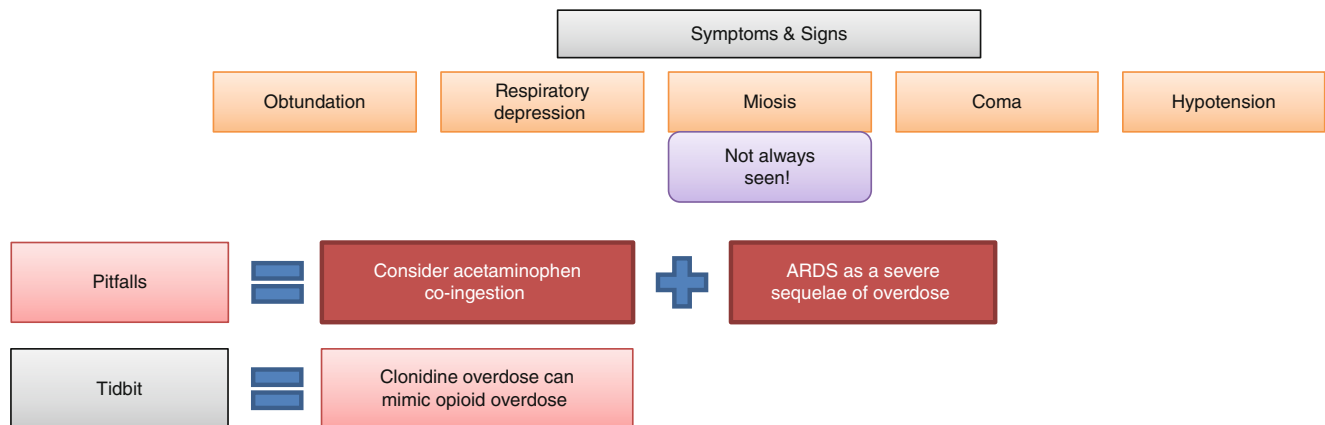
Cholinergic Toxidrome



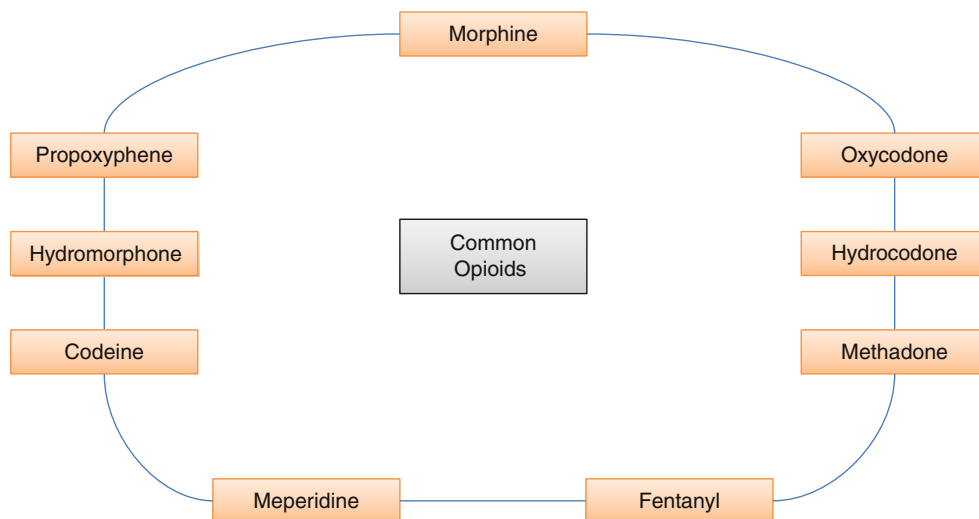
Cholinergic Causes



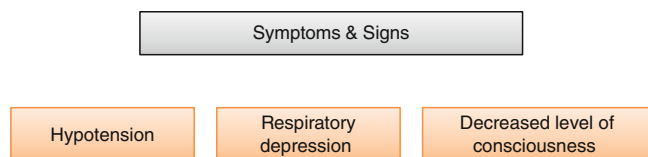
Opioid Toxidrome



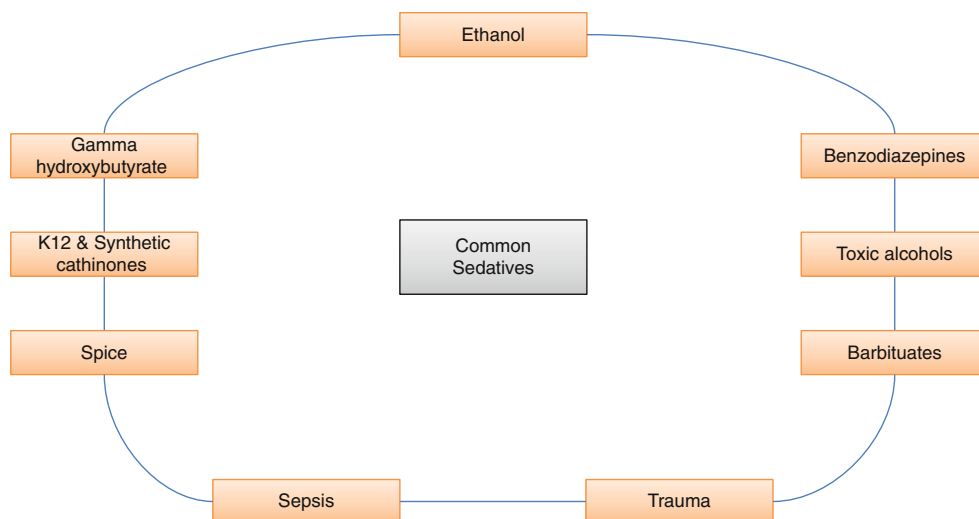
Common Opioids



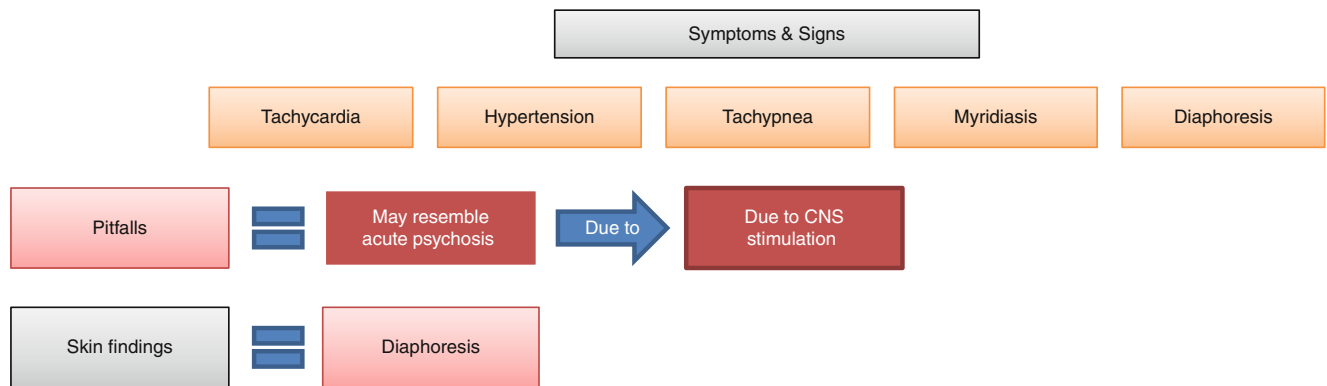
Sedative Toxidrome



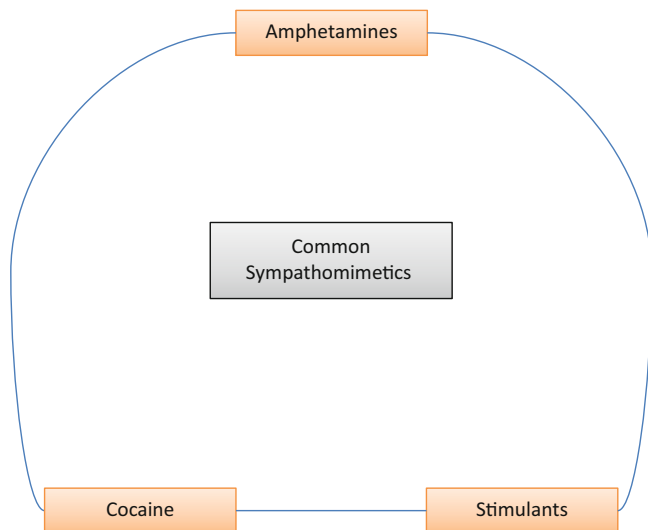
Considerations for Sedative Toxidrome



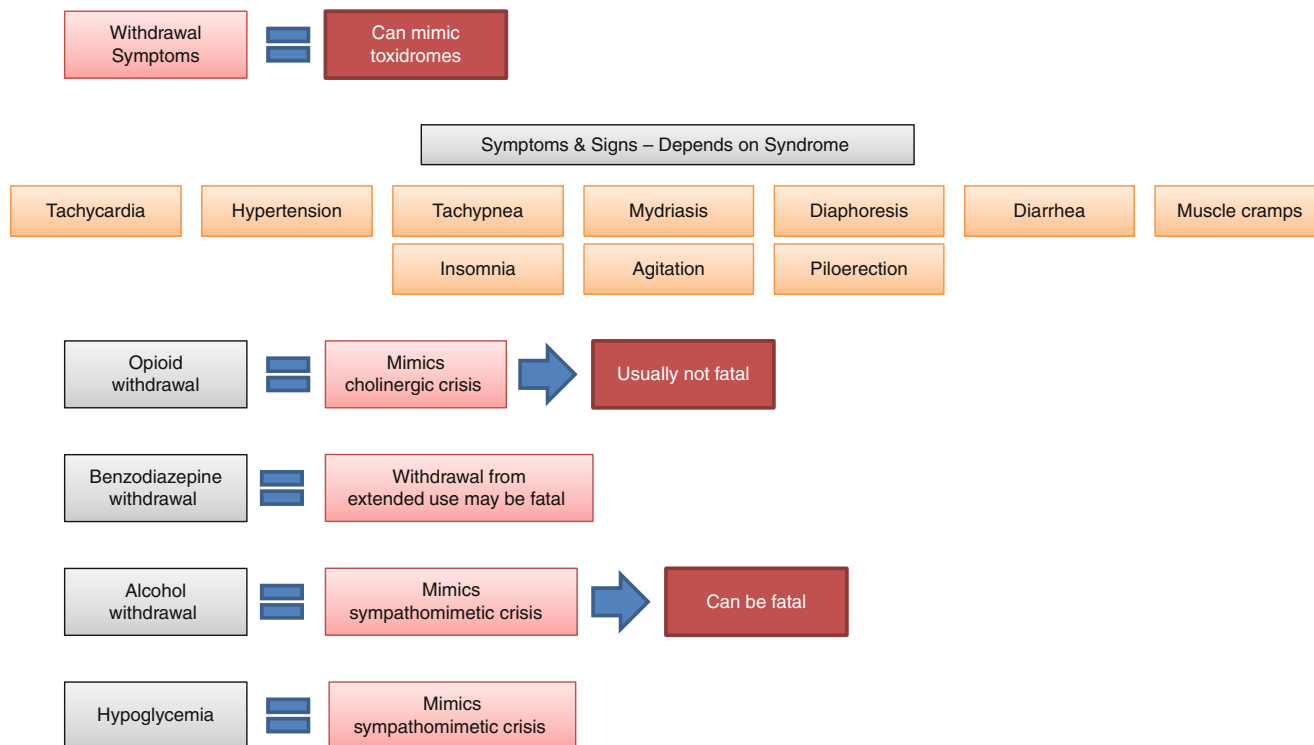
Sympathomimetic Toxidrome



Sympathomimetic Agents

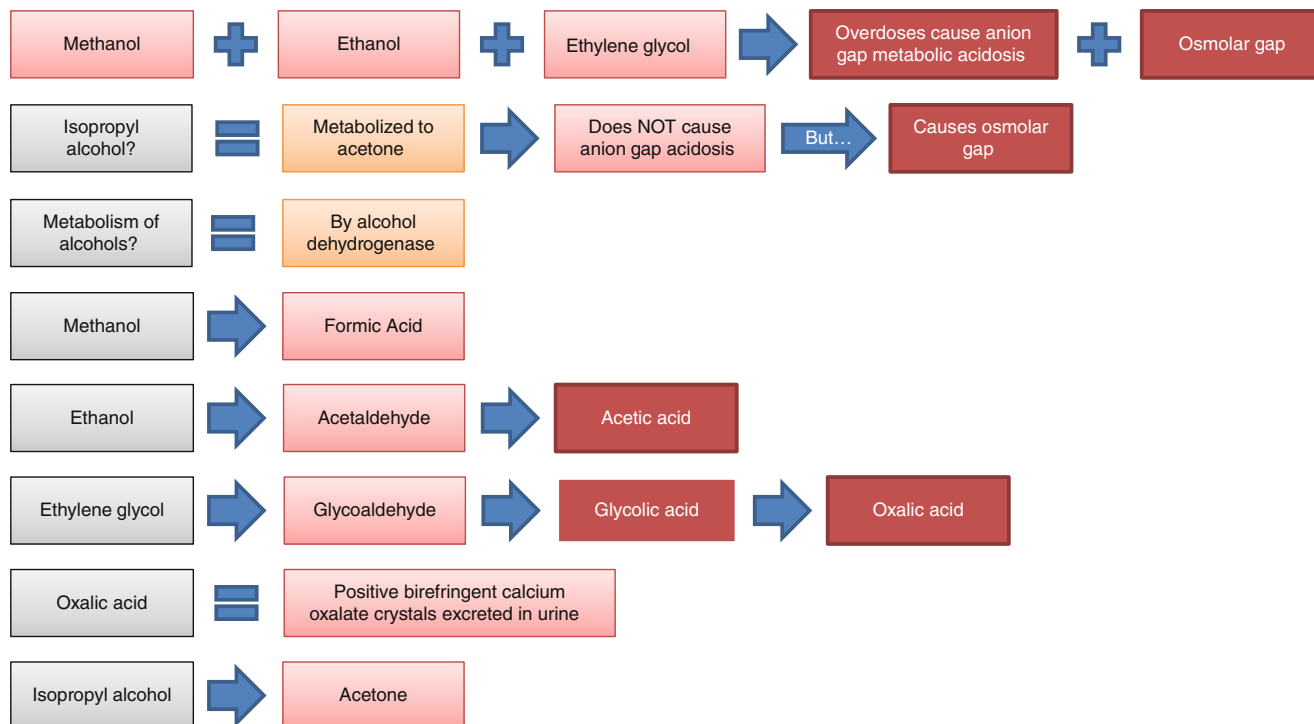


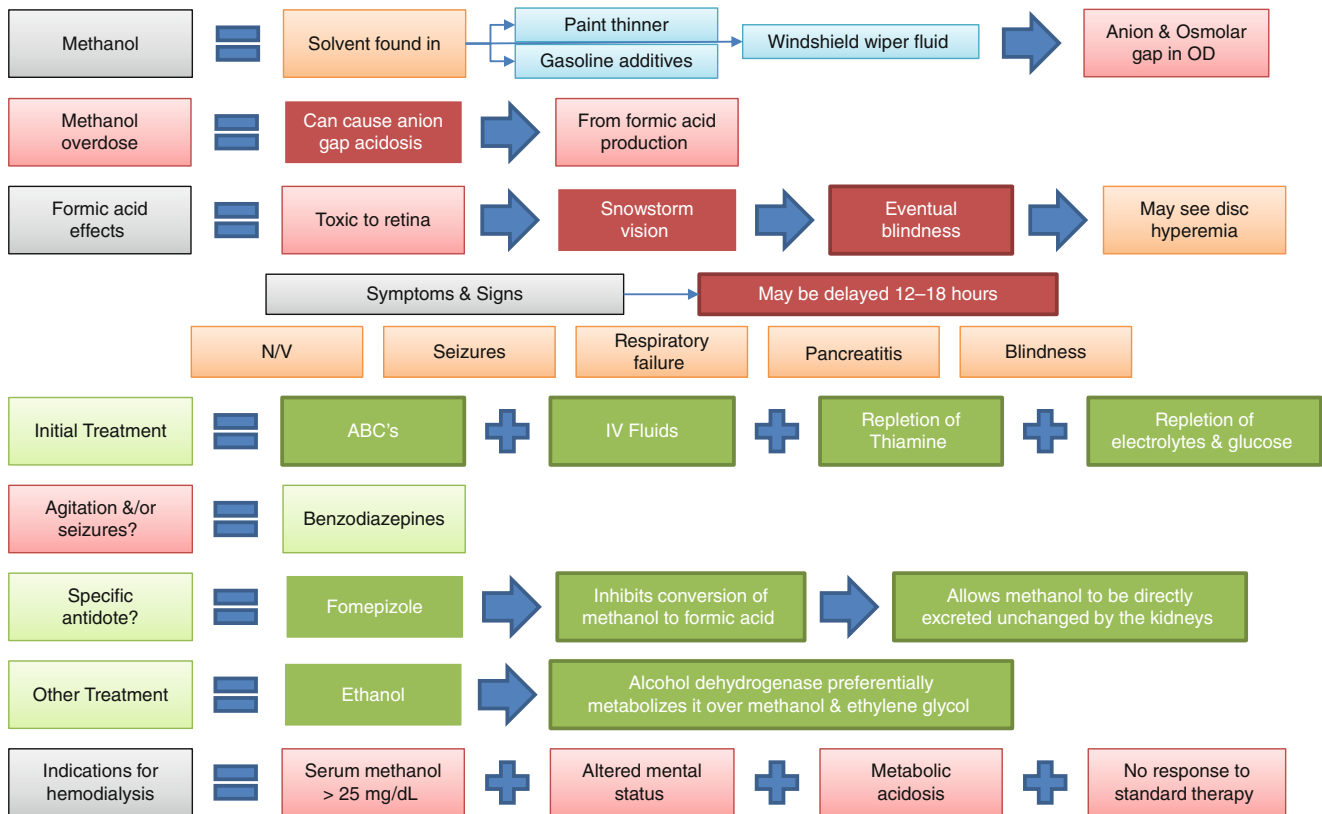
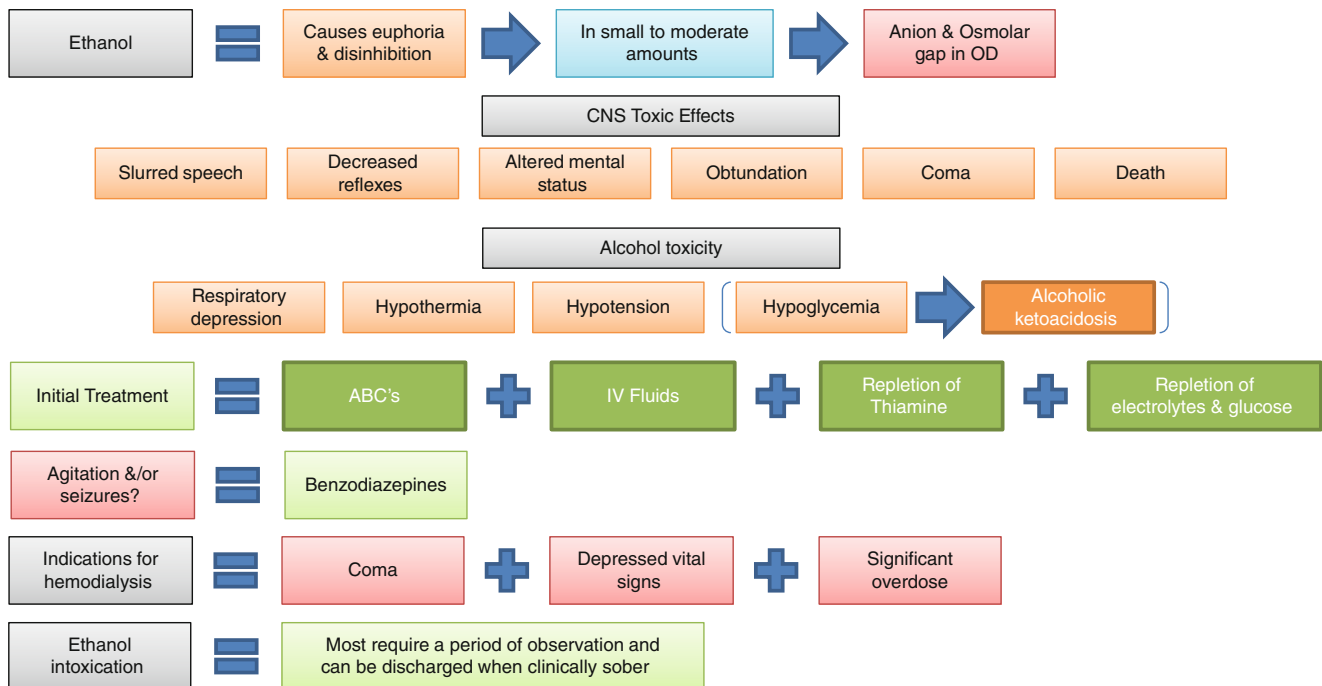
Withdrawal Symptoms



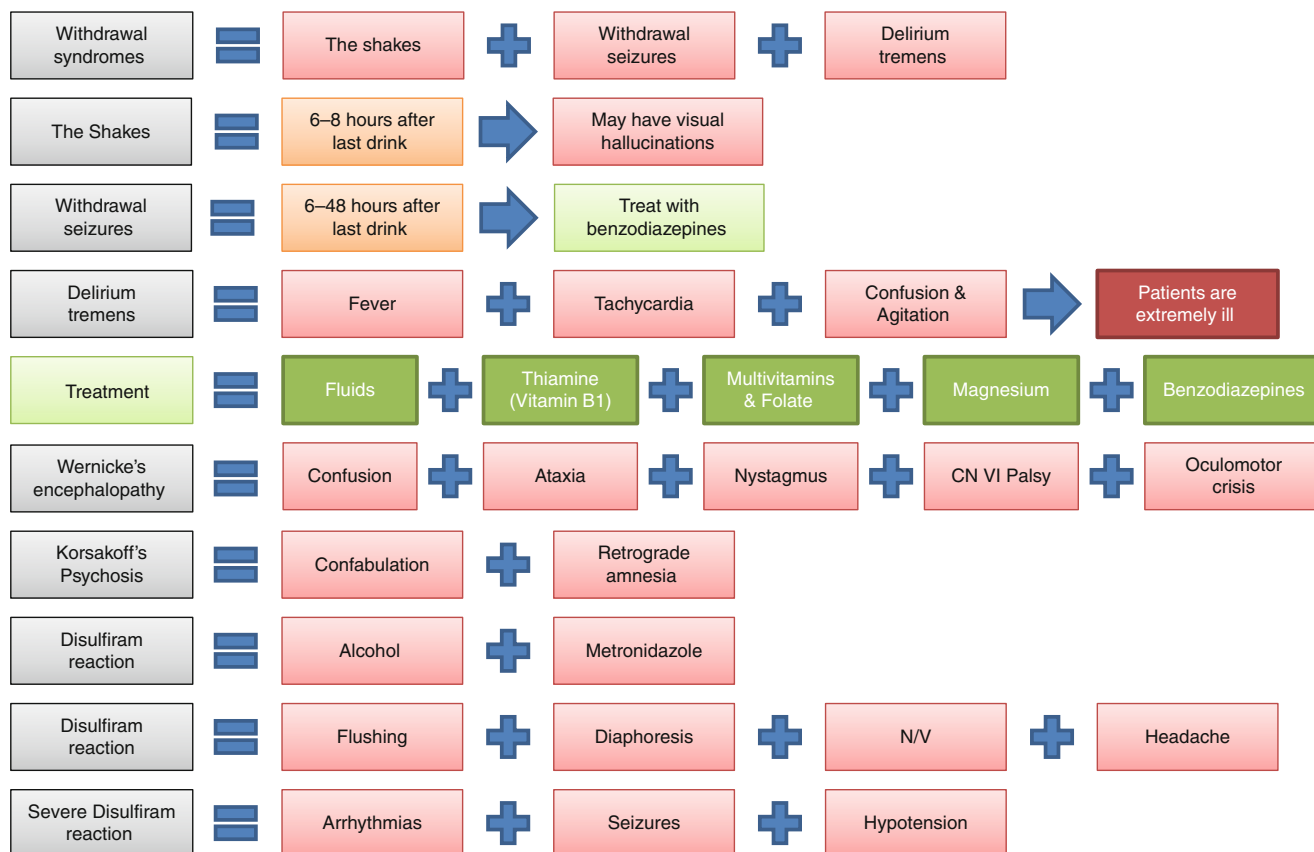
Specific Toxins and Poisons

Alcohols: Introduction

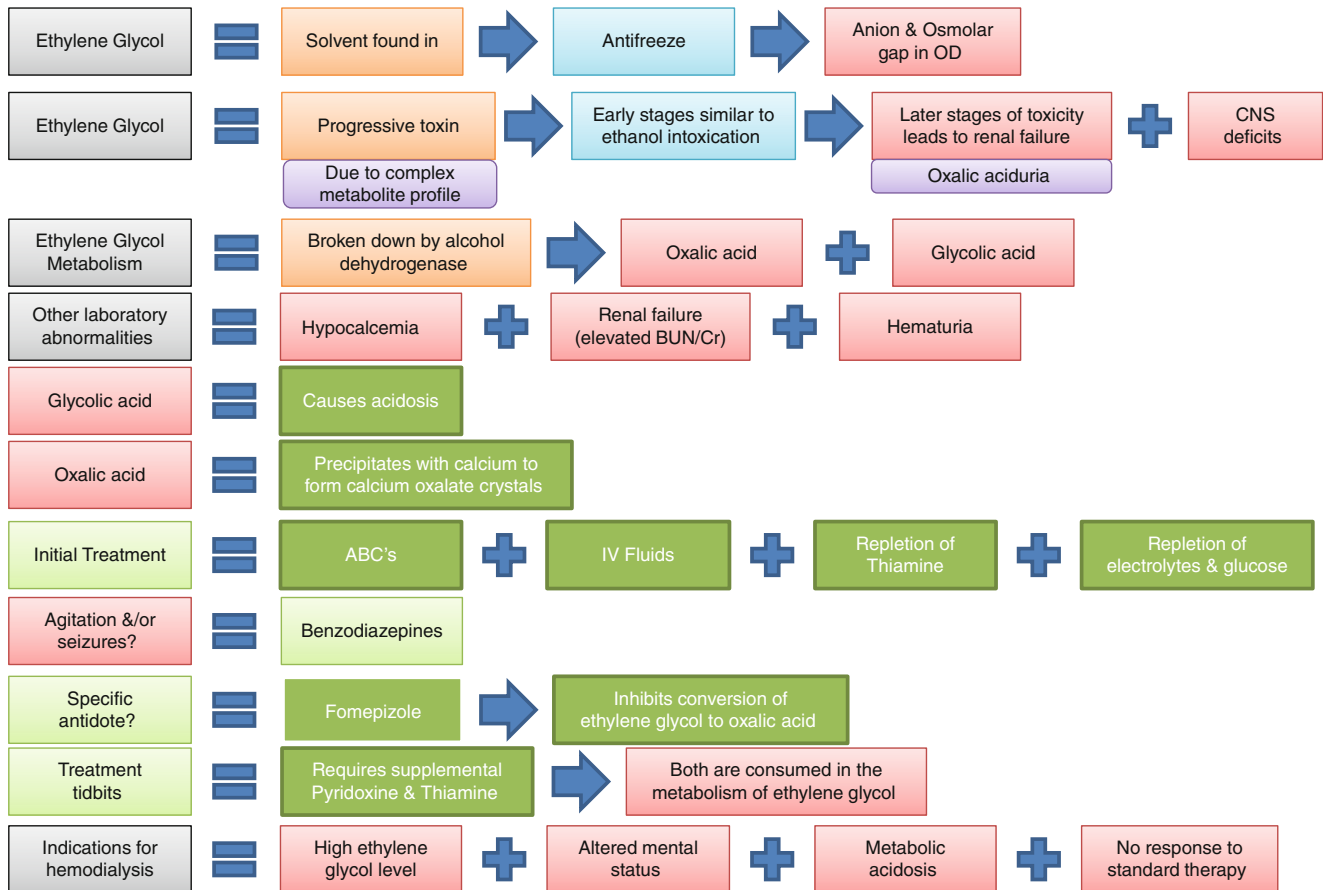


Alcohols: Methanol**Alcohols: Ethanol**

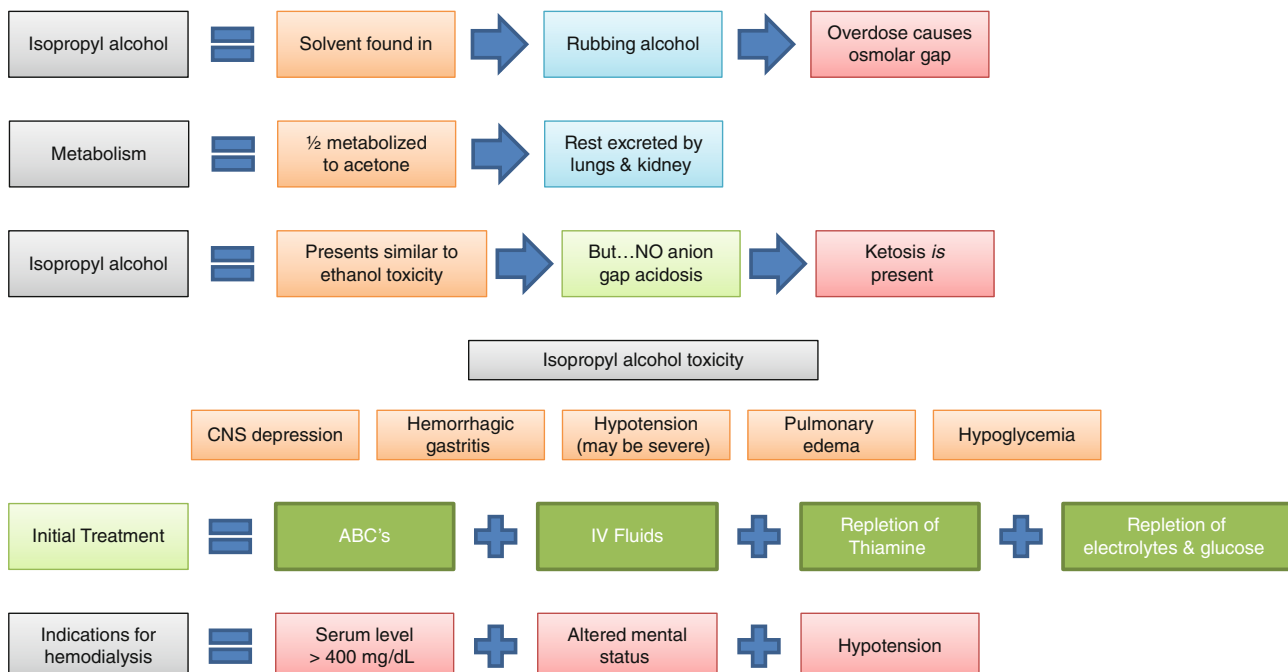
Ethanol Tidbits



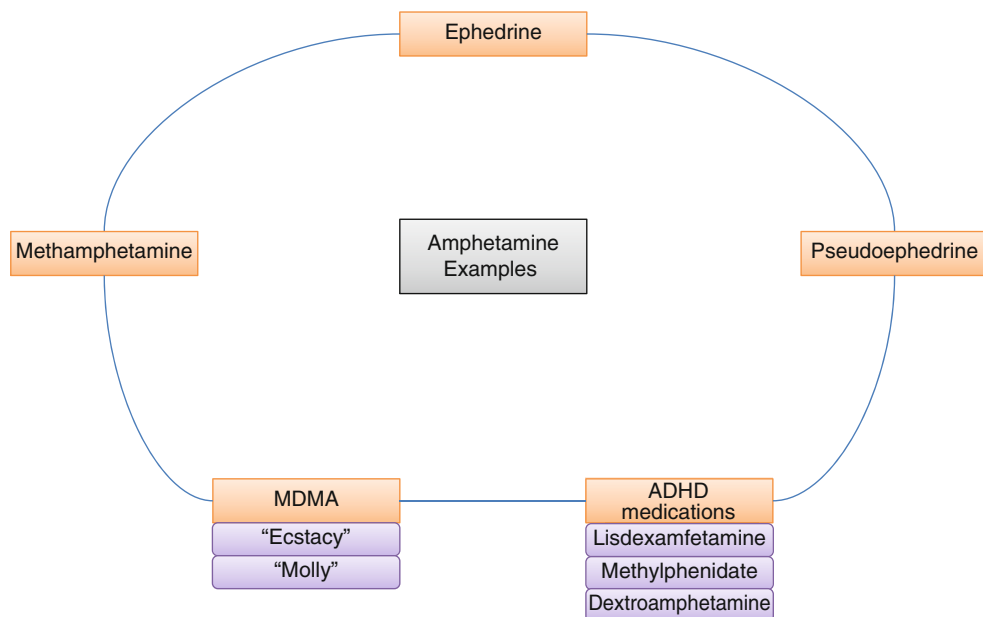
Alcohols: Ethylene Glycol



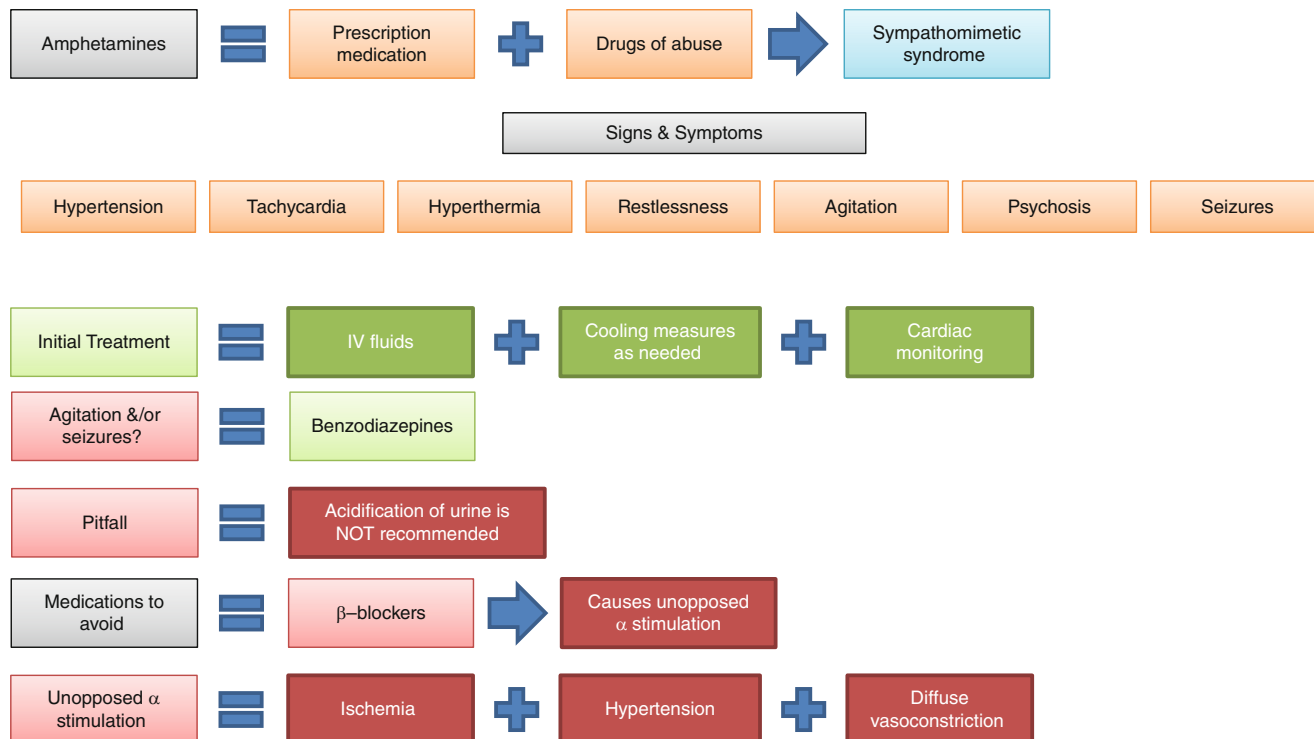
Alcohols: Isopropyl Alcohol



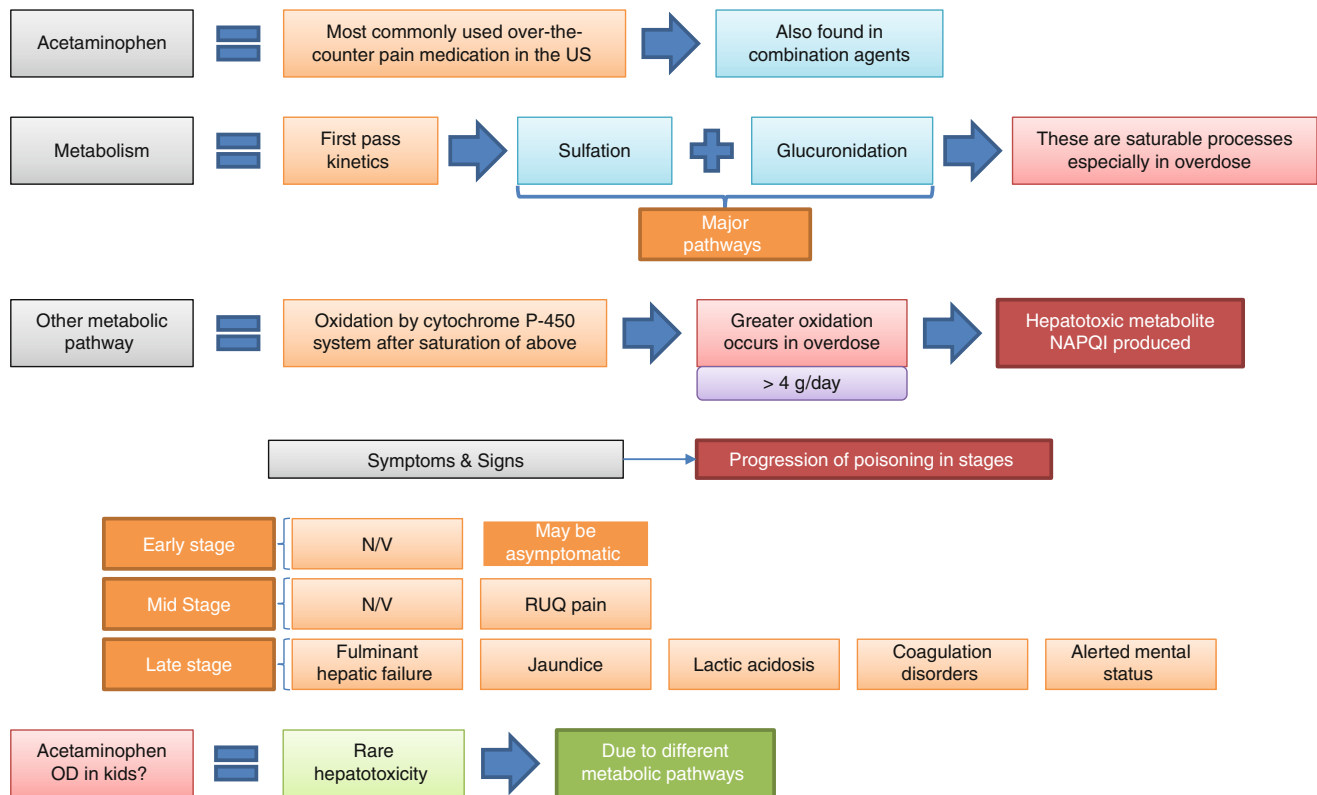
Amphetamine Examples



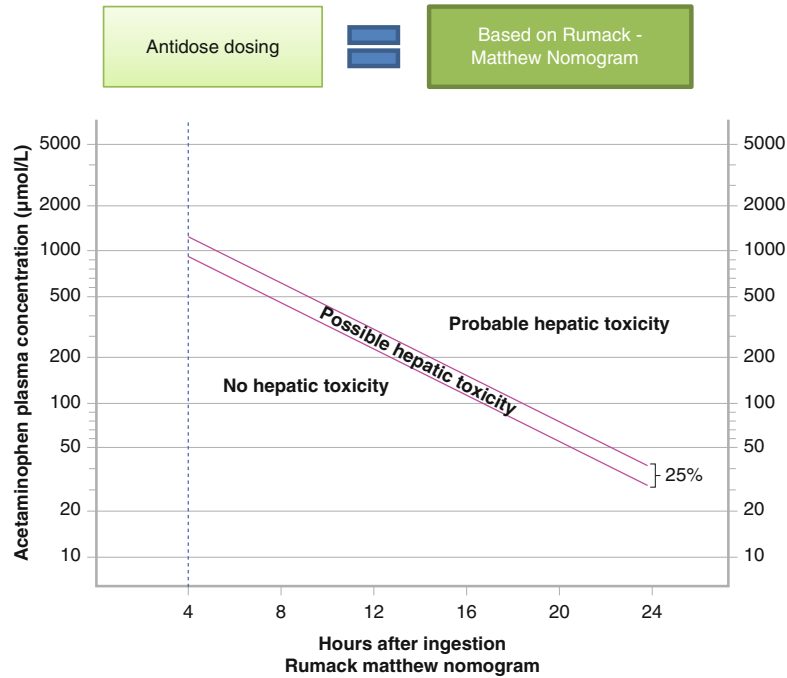
Amphetamines



Analgesics: Acetaminophen



Rumack-Matthew Nomogram



Tidbits

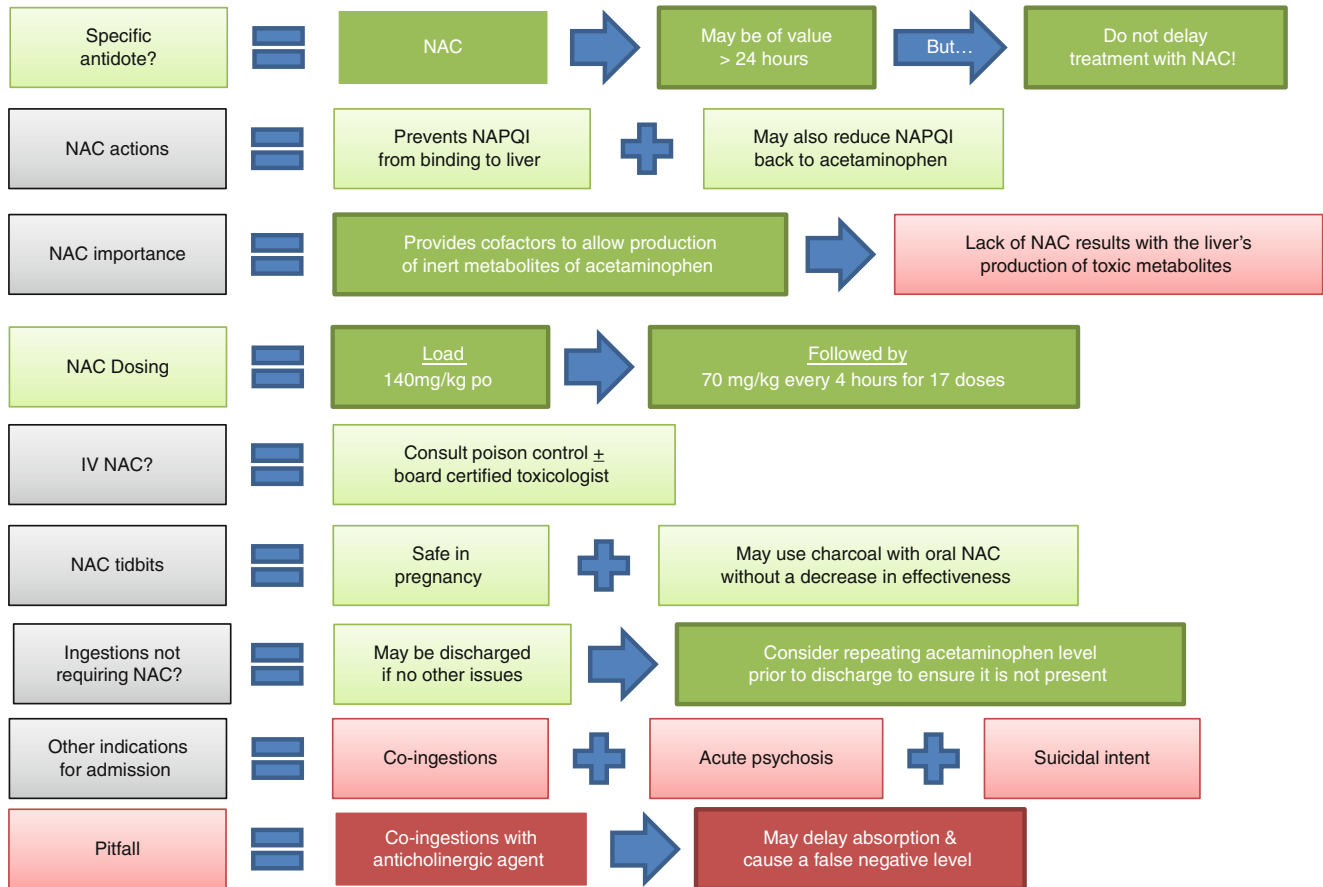
A level of > 150 mg/dL at the four level requires treatment with NAC

Treat multiple ingestions as a single ingestion initiated at the first ingestion

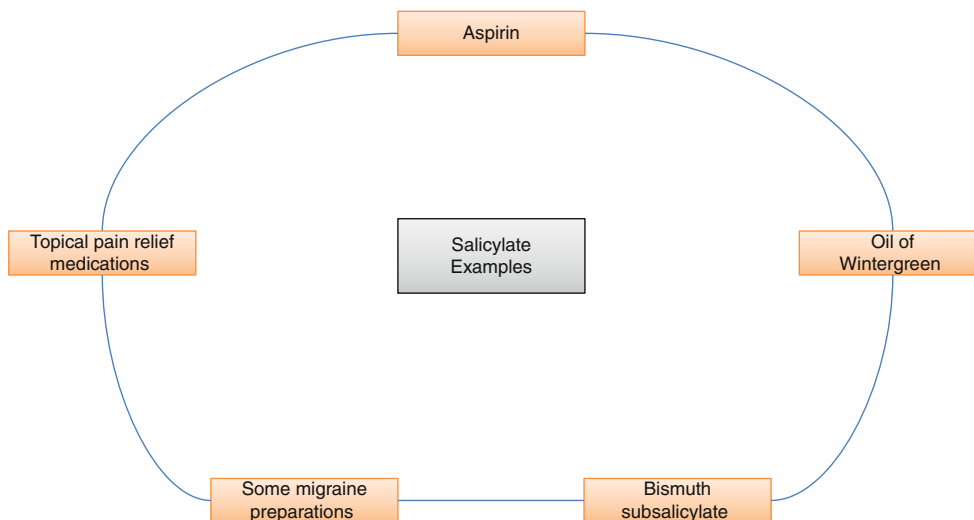
Nomogram pitfall

Less useful for delayed presentations > 24 hours or for modified-release formulations

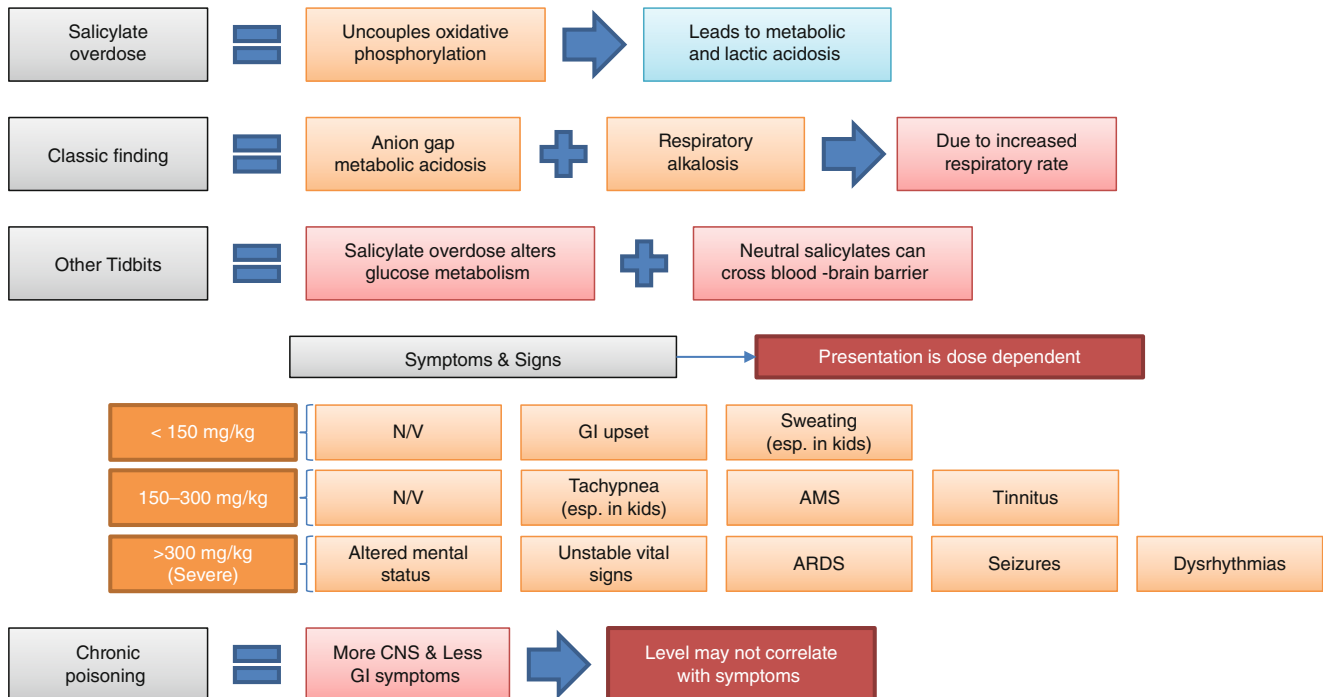
Acetaminophen Overdose Treatment



Salicylate Examples



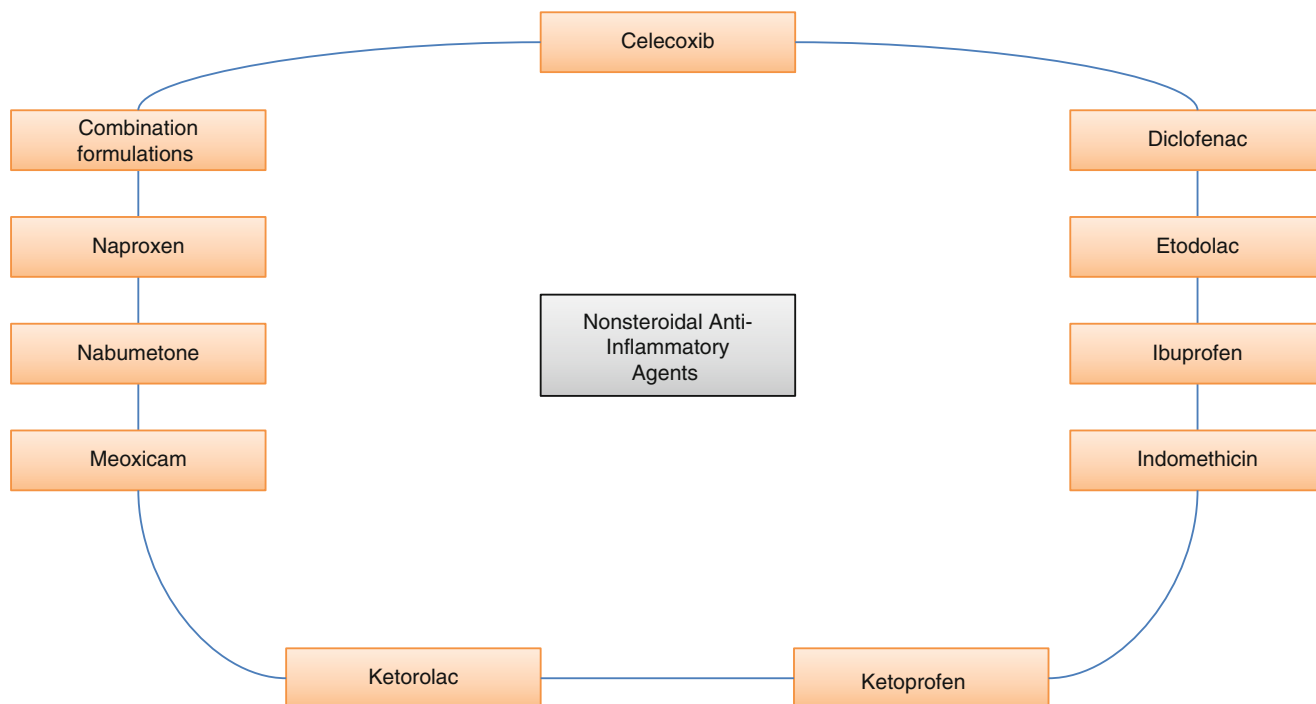
Analgesics: Salicylates



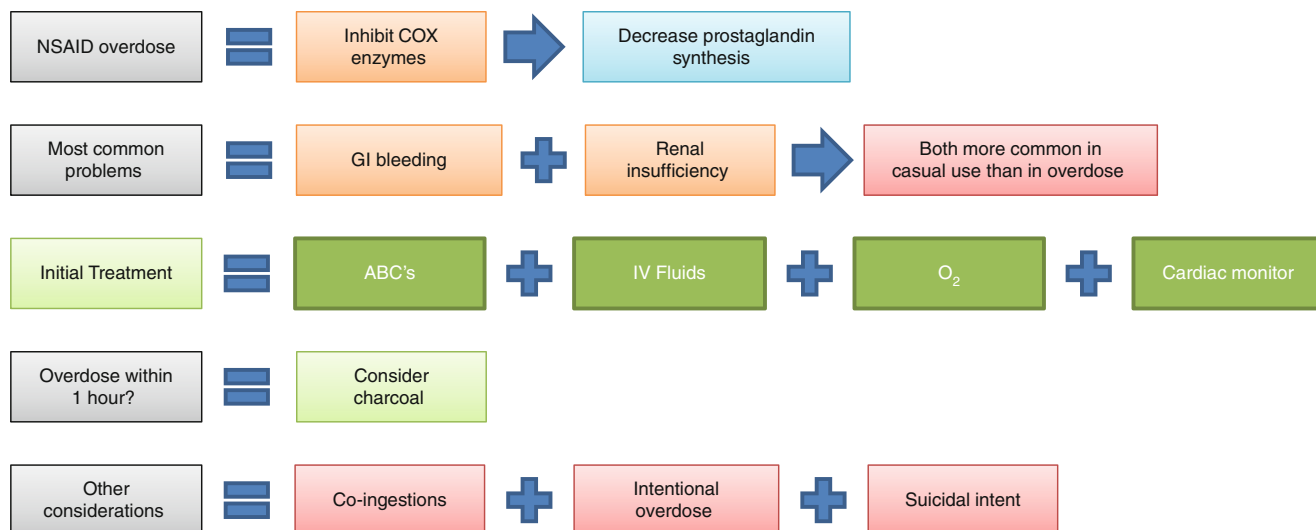
Salicylate Overdose Treatment



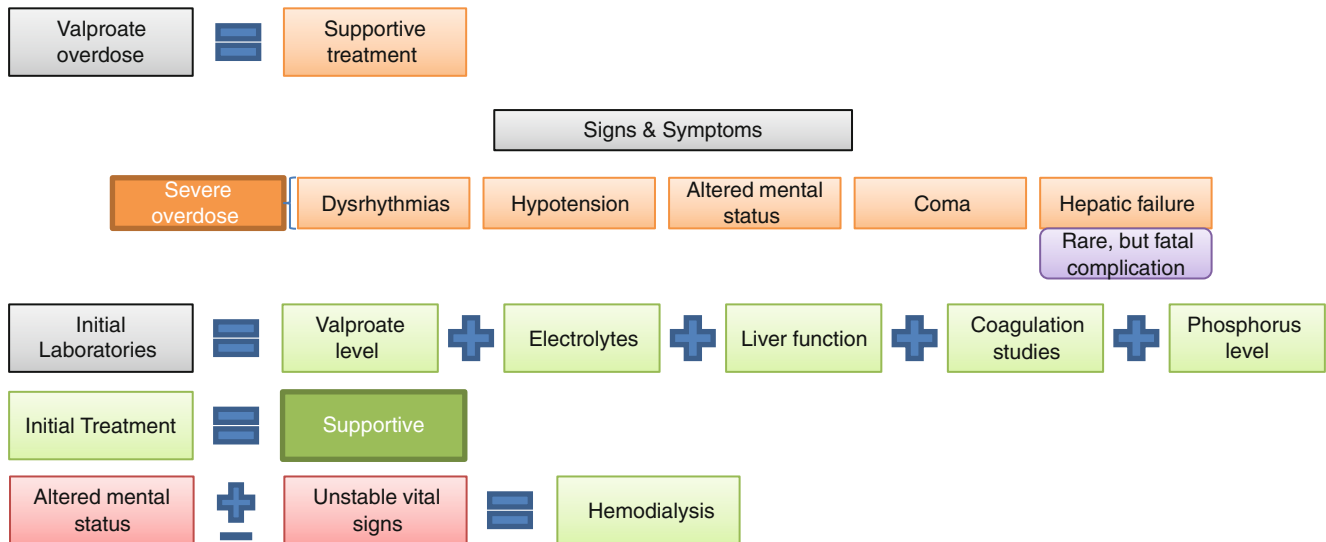
Nonsteroidal Anti-Inflammatory Agents



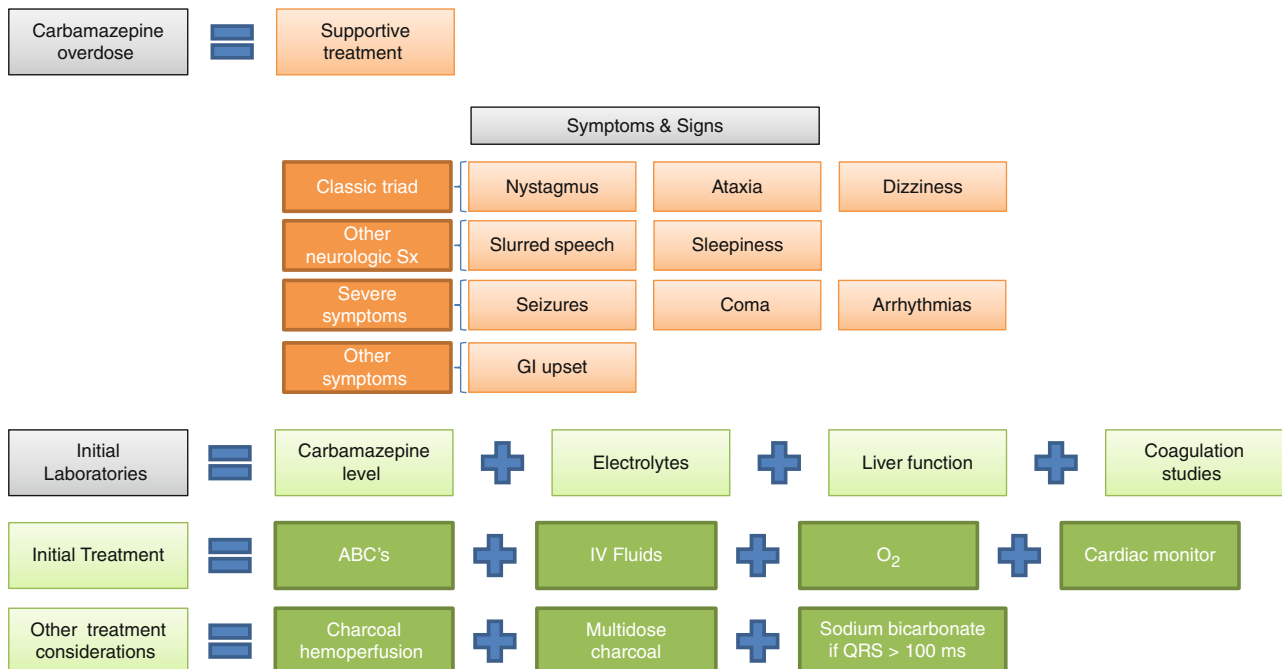
Analgesics: NSAIDs



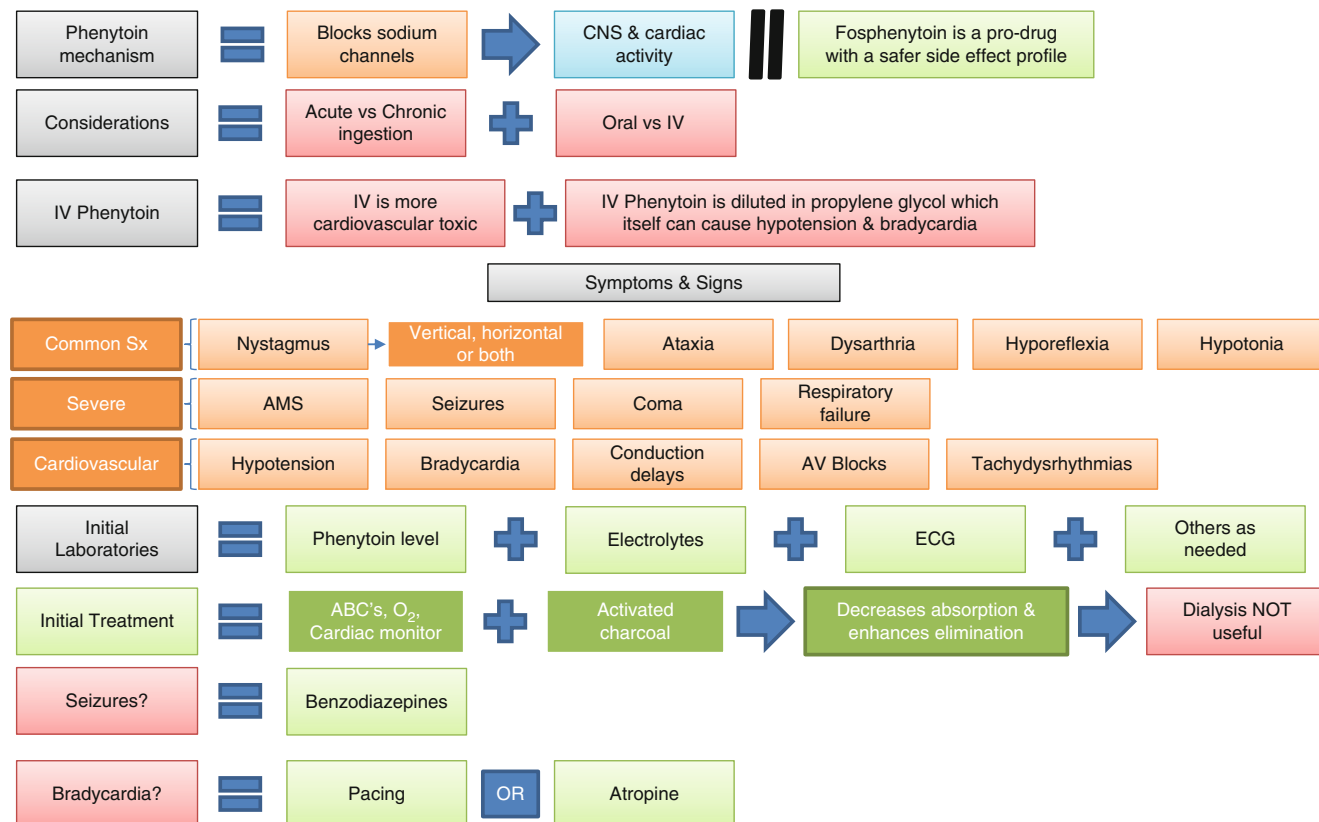
Anticonvulsants: Valproate



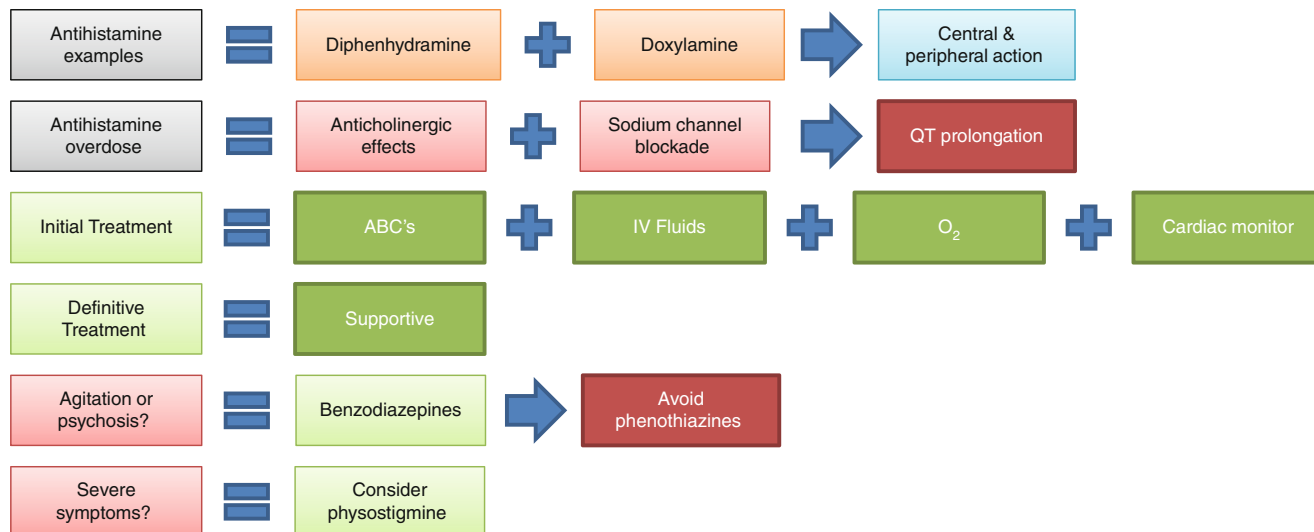
Anticonvulsants: Carbamazepine



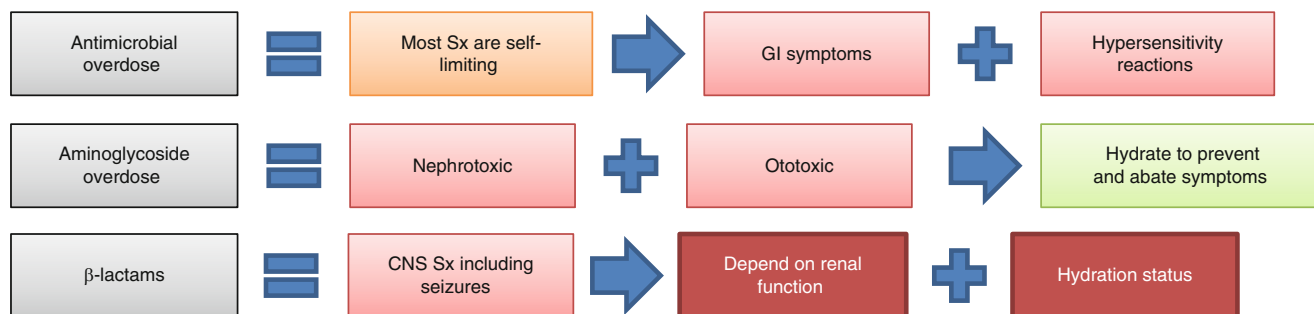
Anticonvulsants: Phenytoin and Fosphenytoin



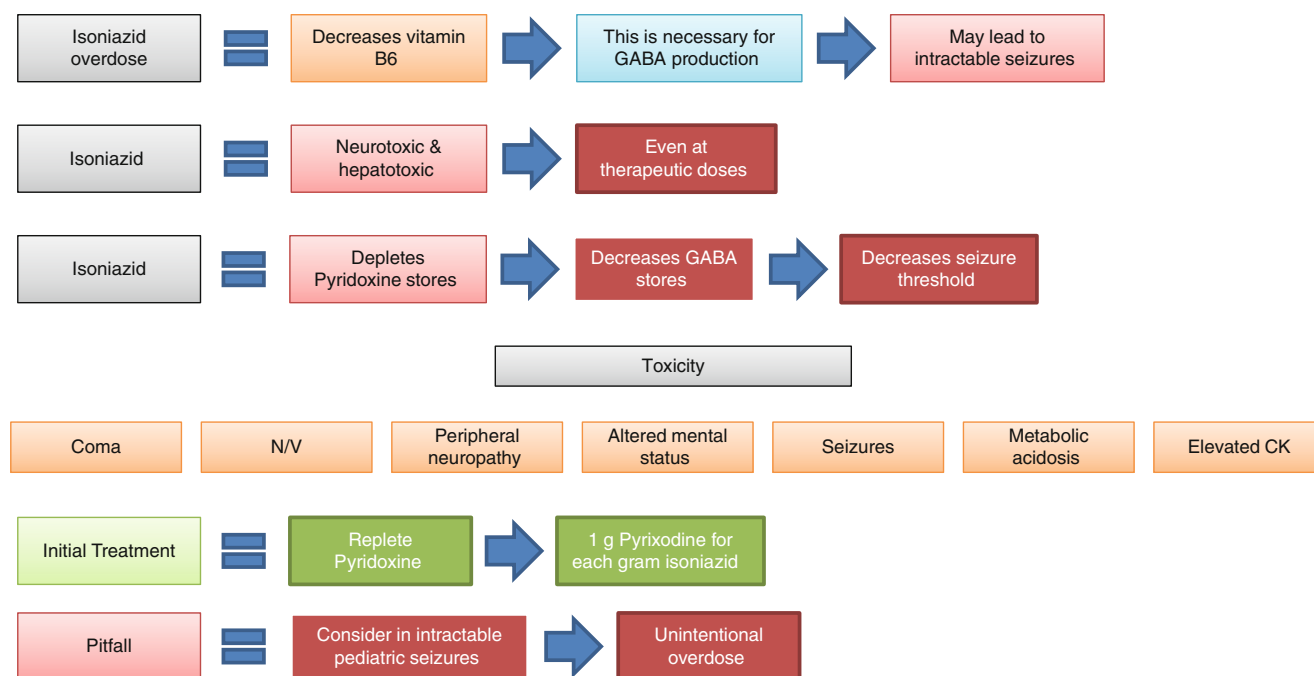
Antihistamines



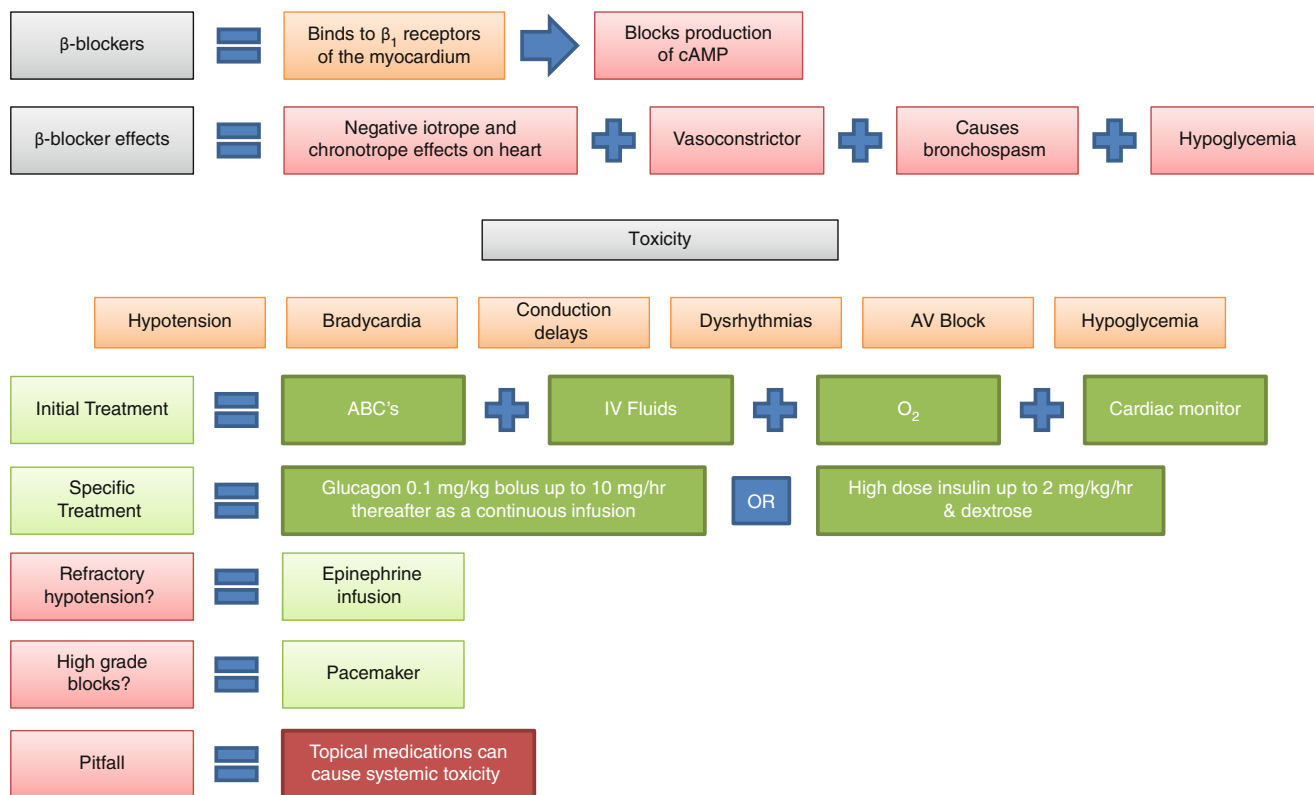
Antimicrobials



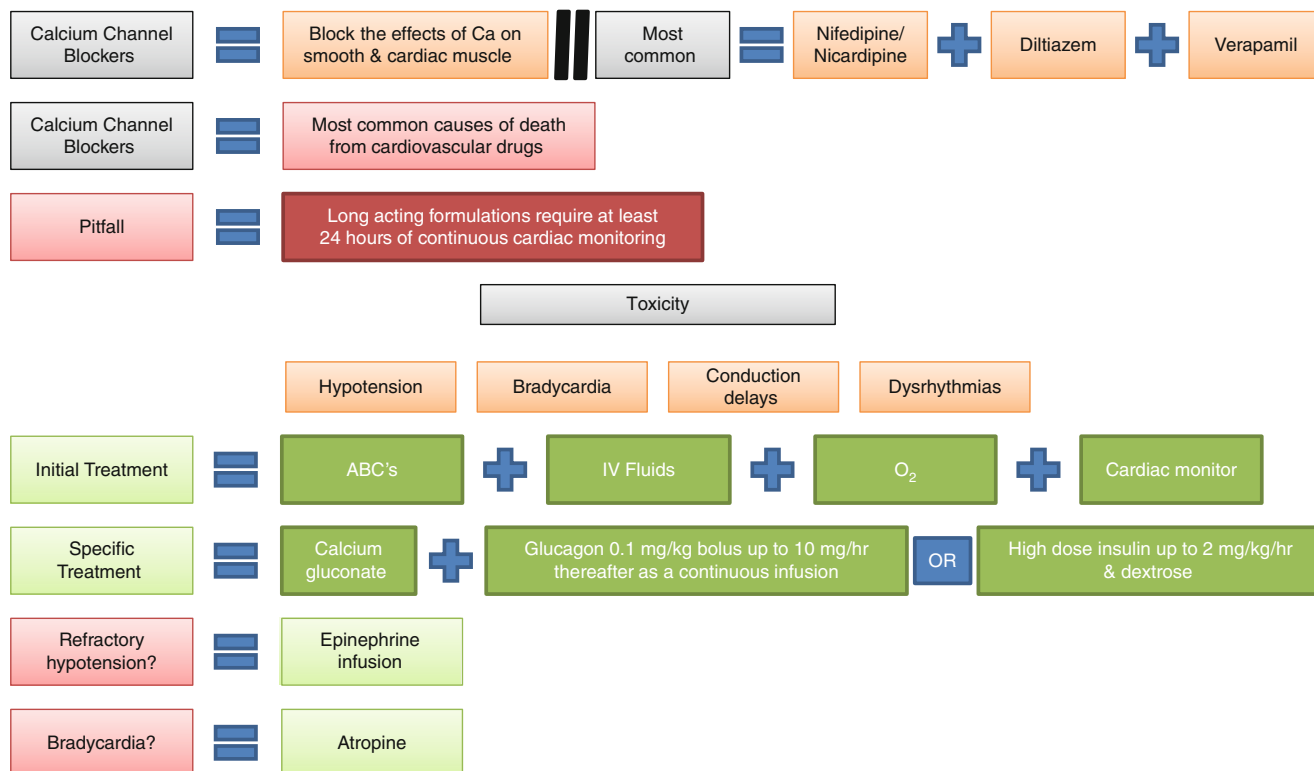
Isoniazid



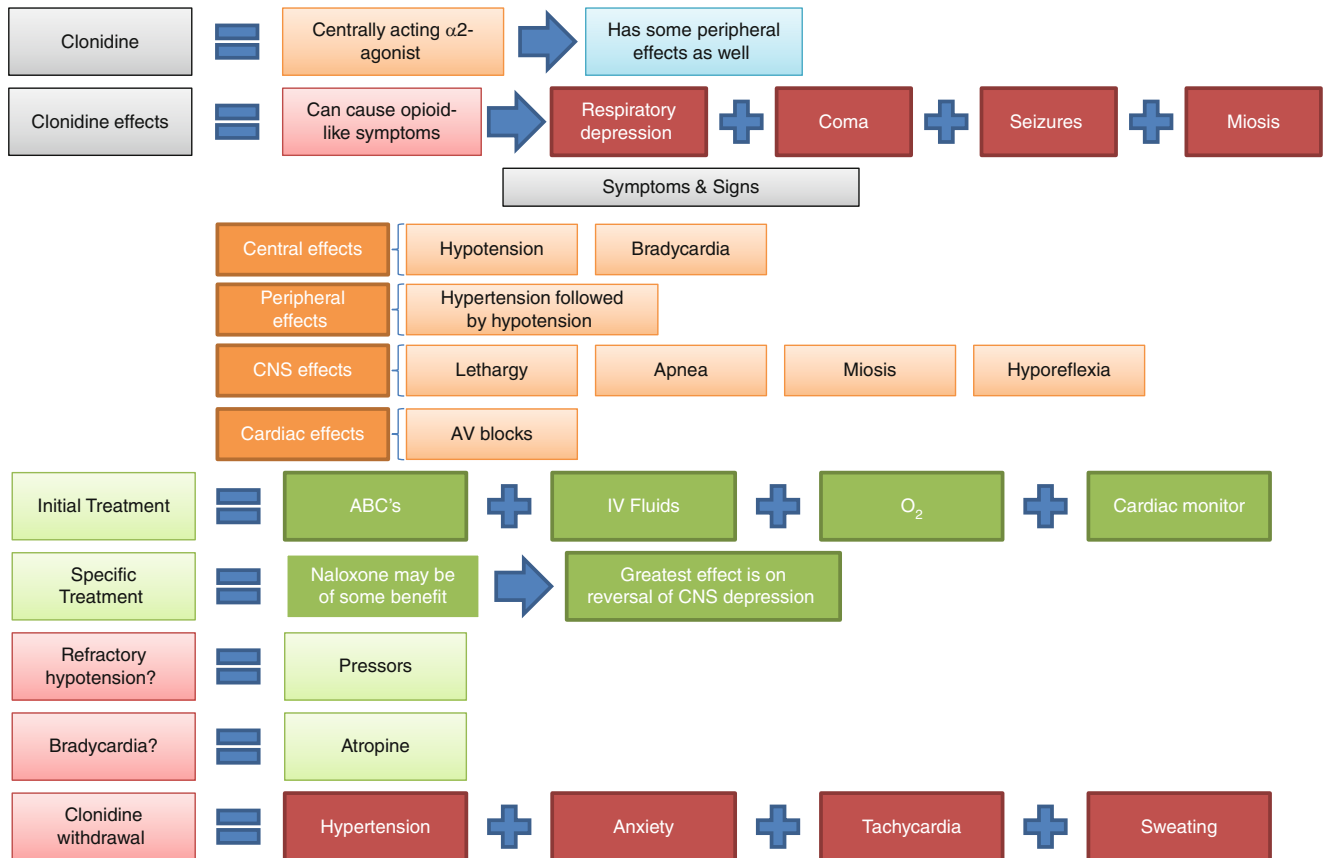
Cardiac Medications: β -Blockers



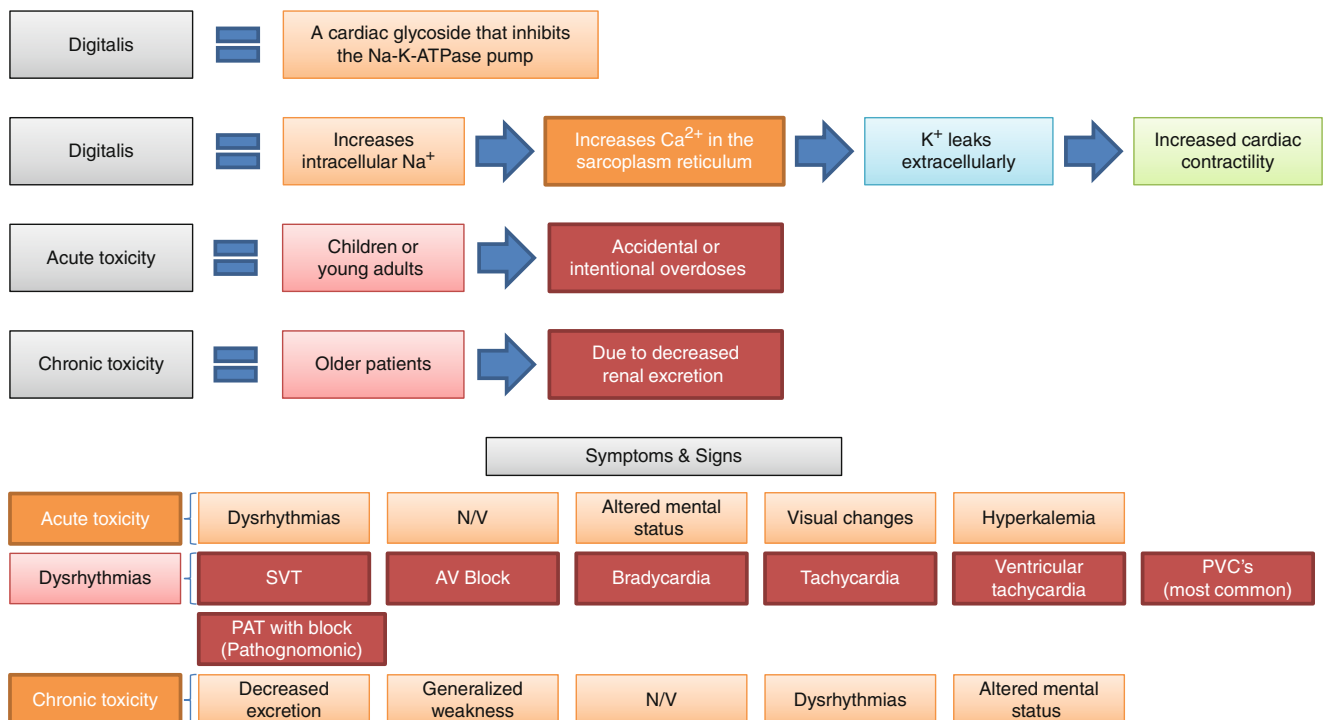
Cardiac Medications: Calcium Channel Blockers



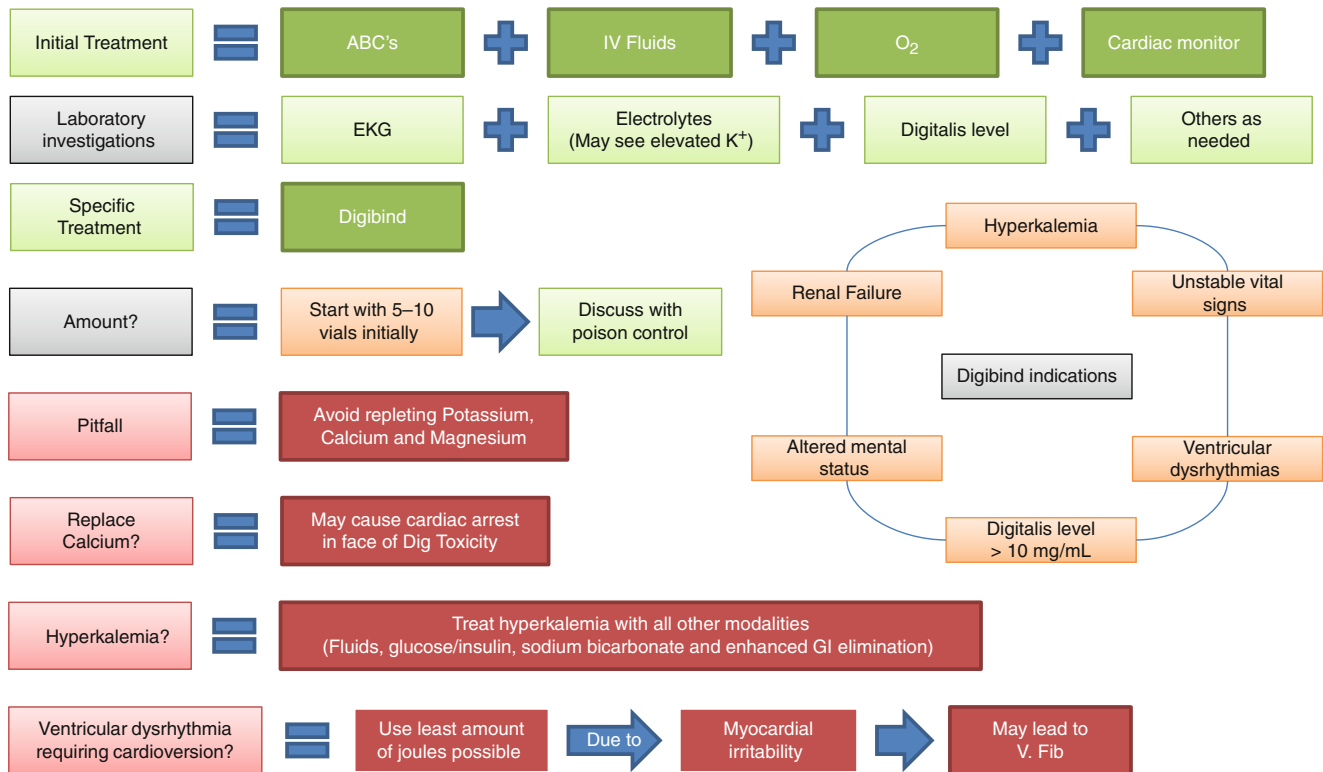
Cardiac Medications: Clonidine



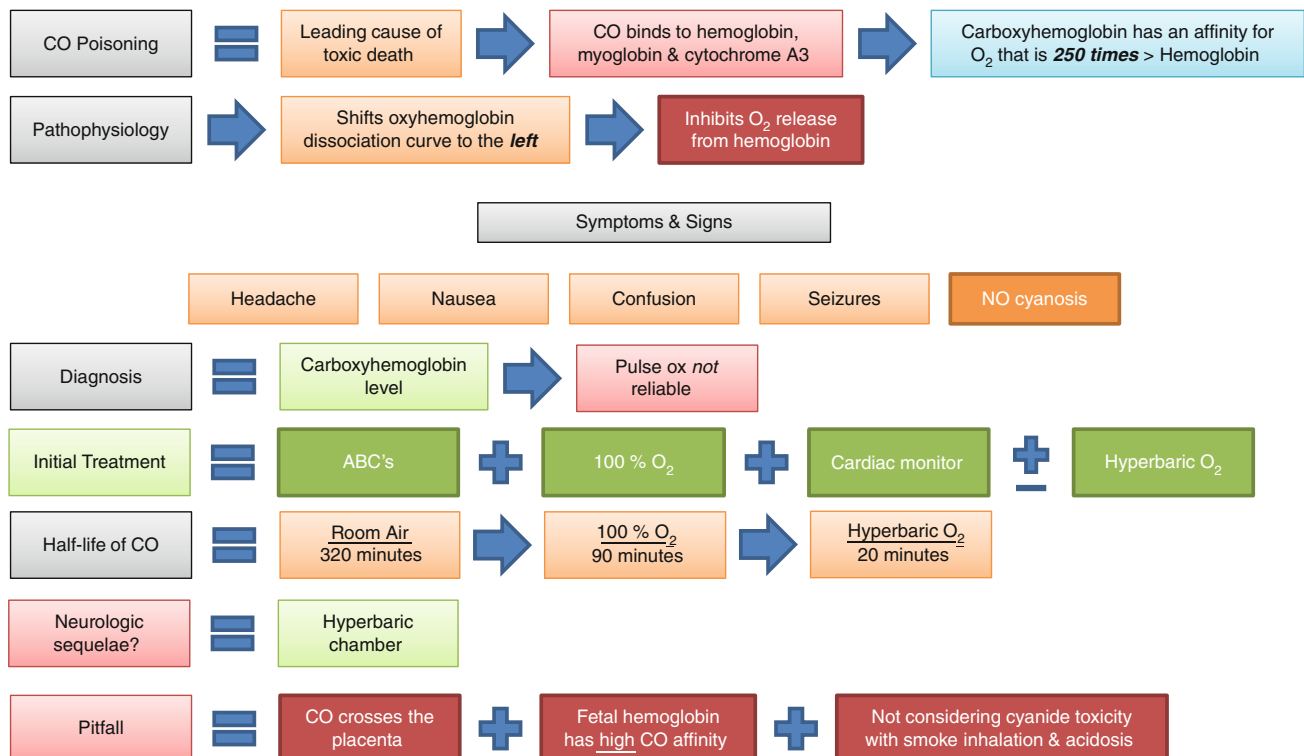
Cardiac Medications: Digitalis



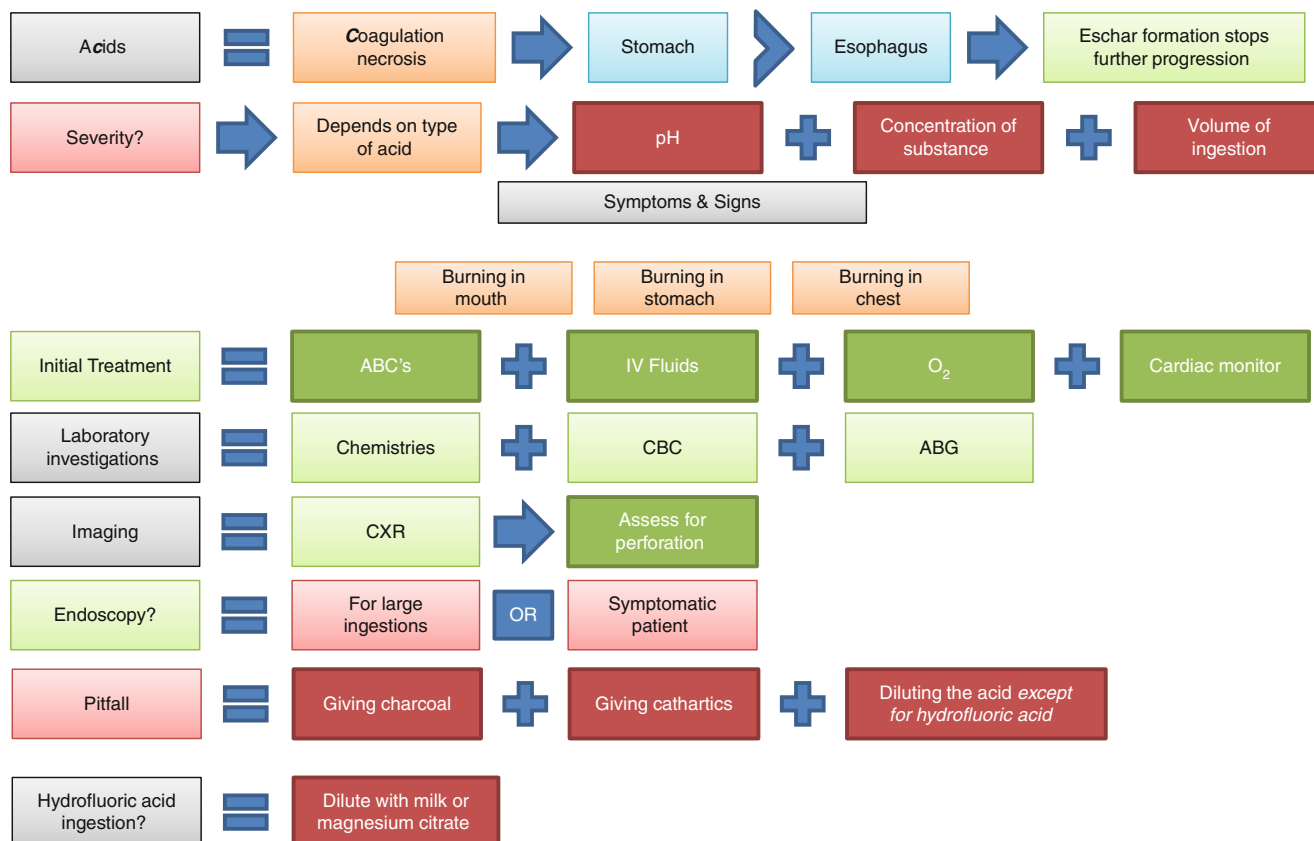
Digitalis Management and Treatment



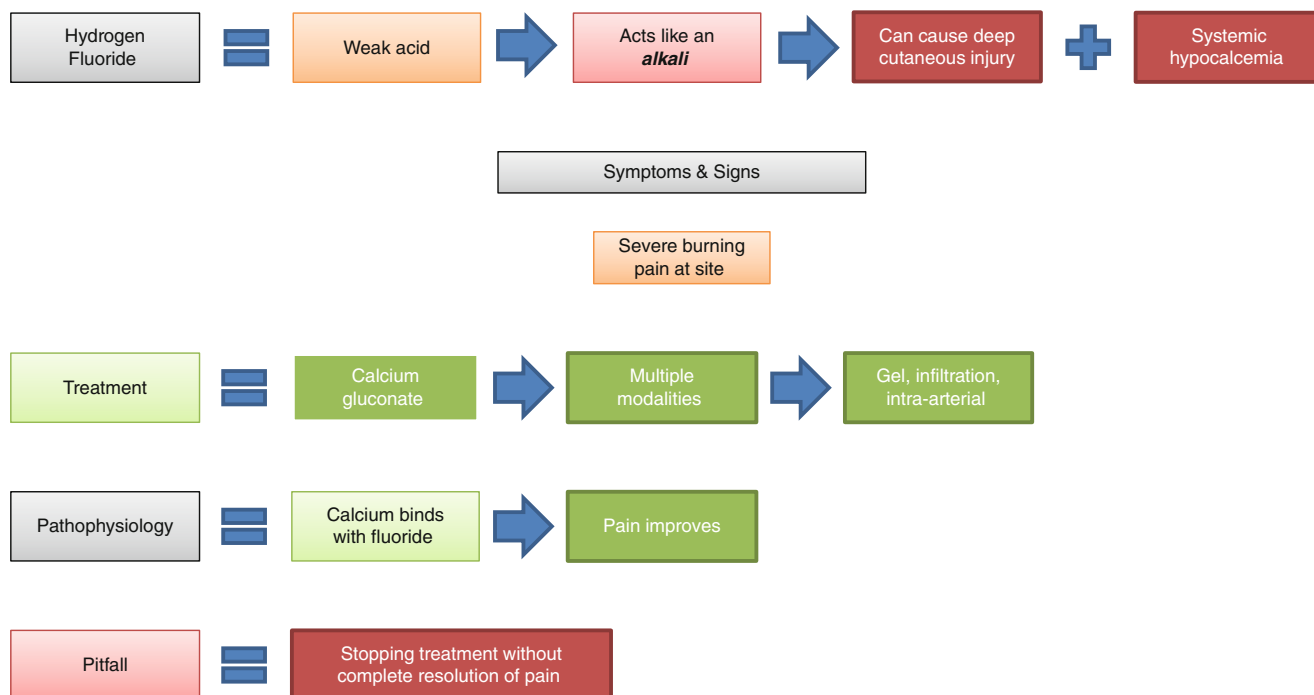
Carbon Monoxide (CO) Poisoning



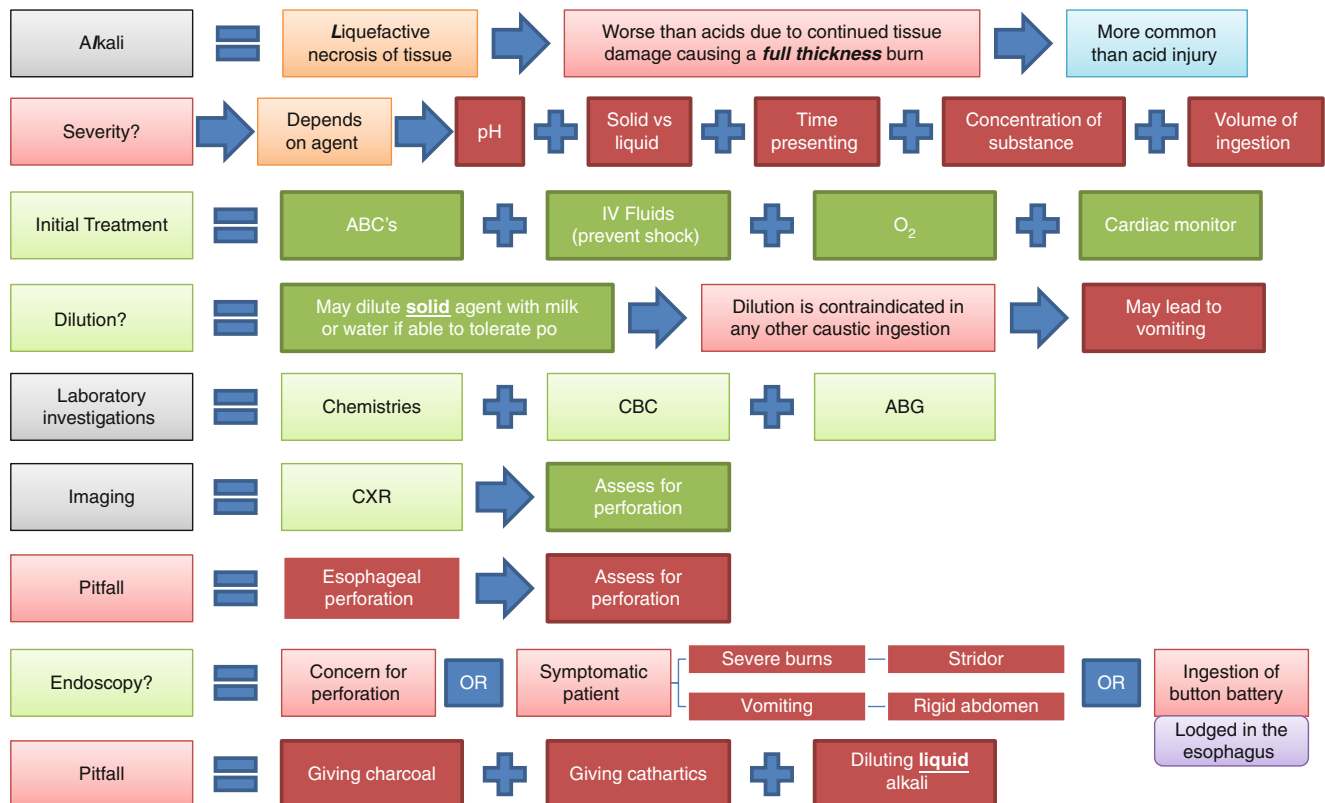
Caustic Agents: Acids



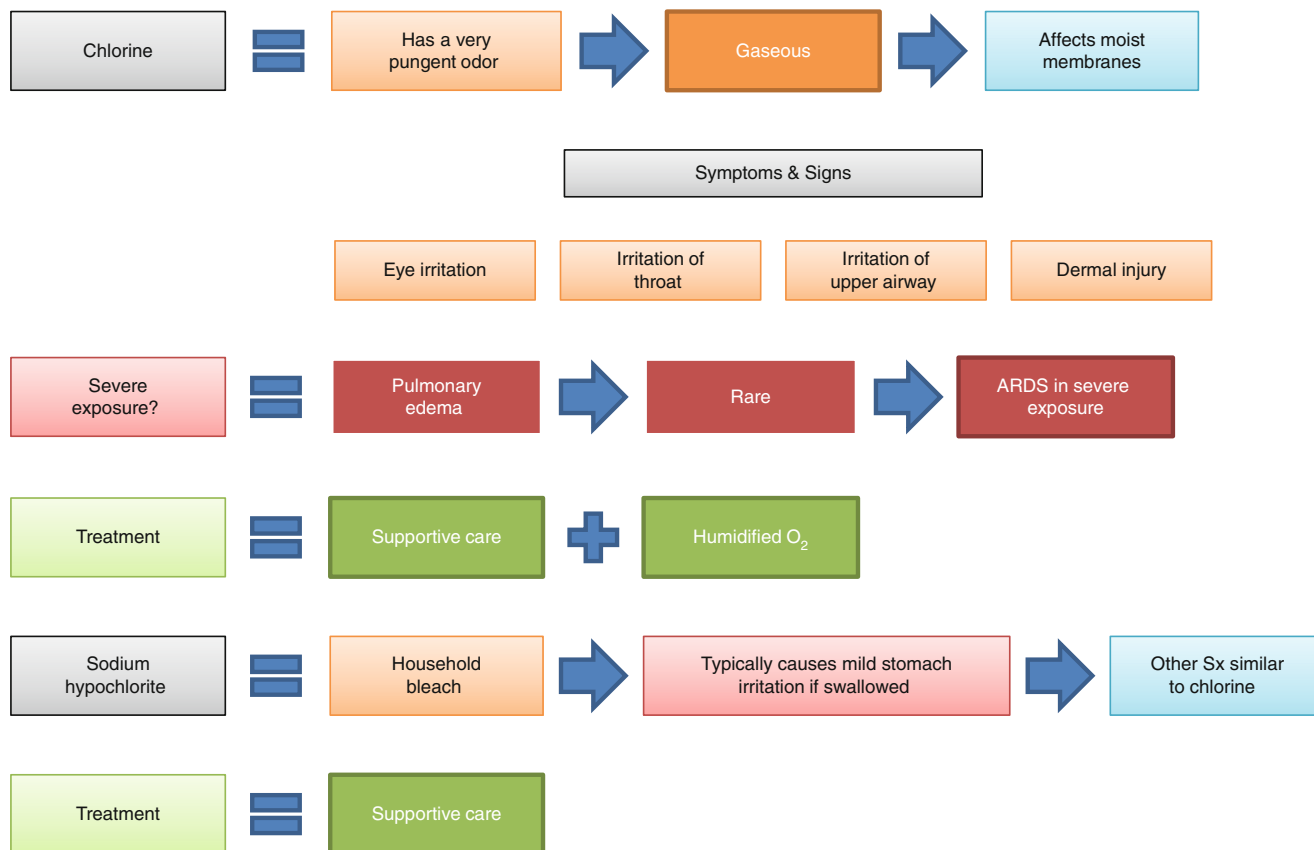
Specific Acid: Hydrogen Fluoride



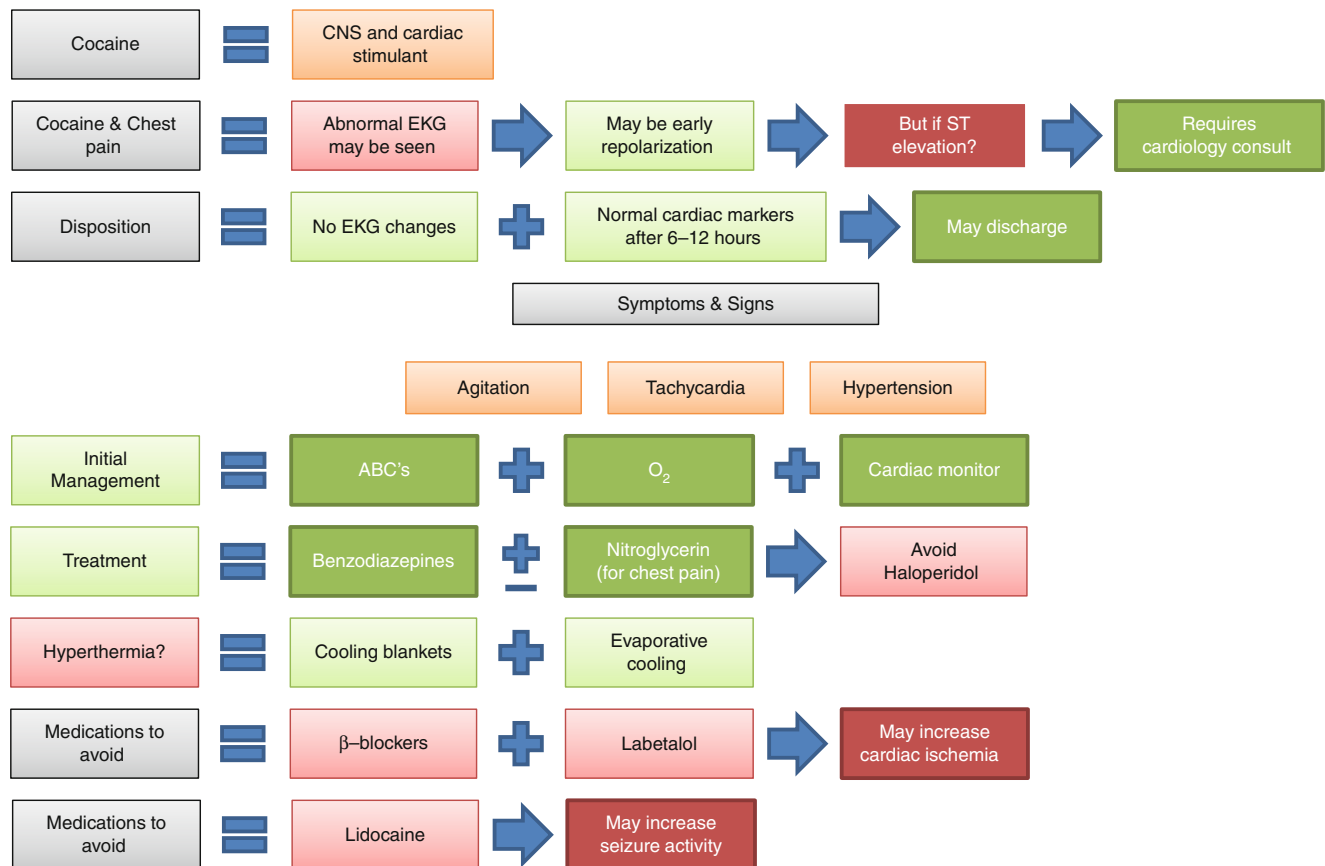
Caustic Agents: Alkali



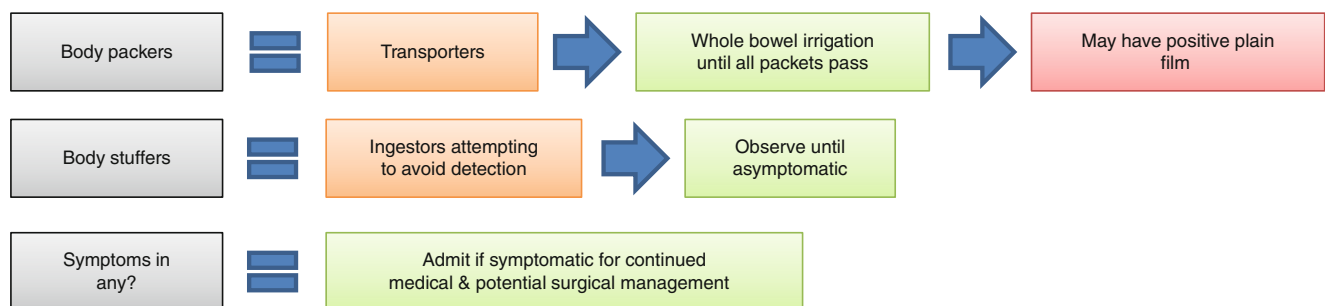
Chlorine



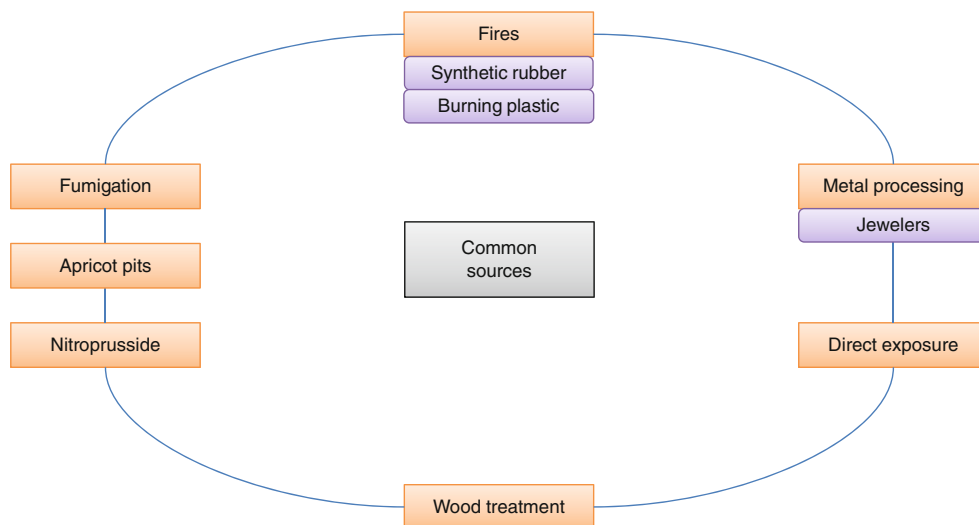
Cocaine



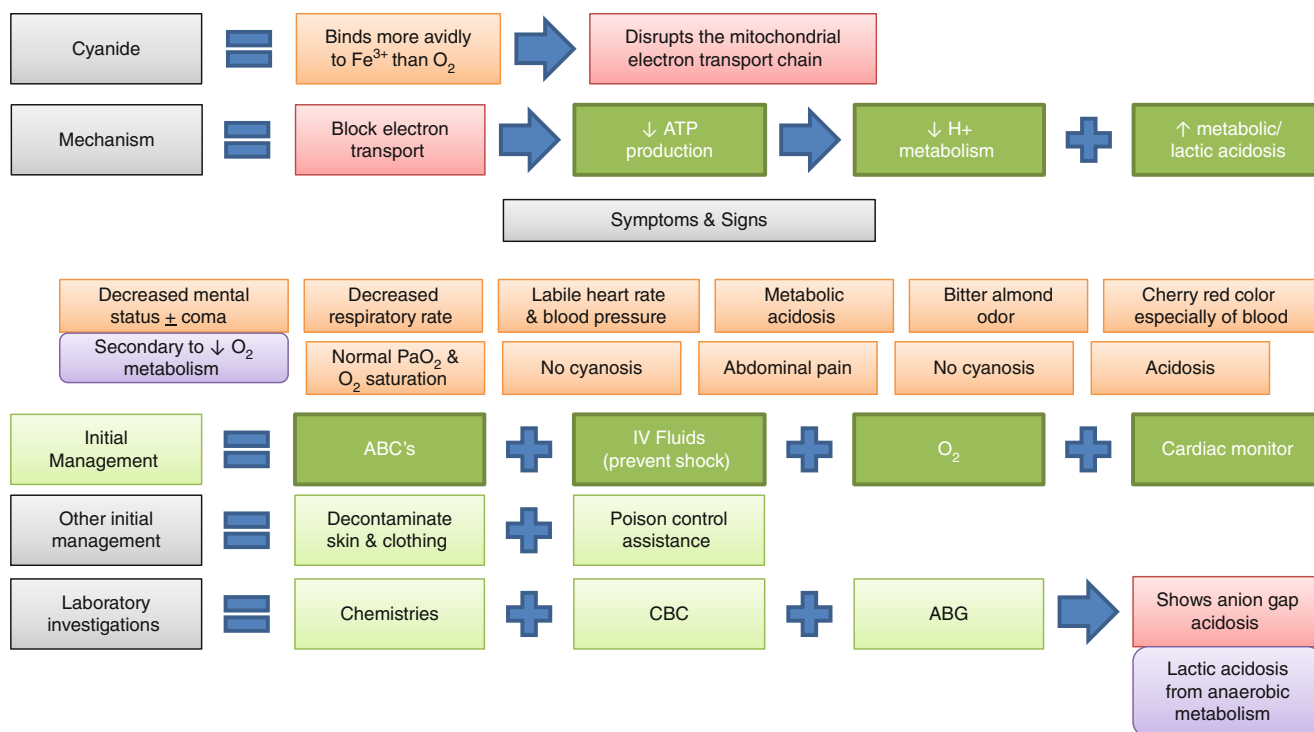
Cocaine Tidbits



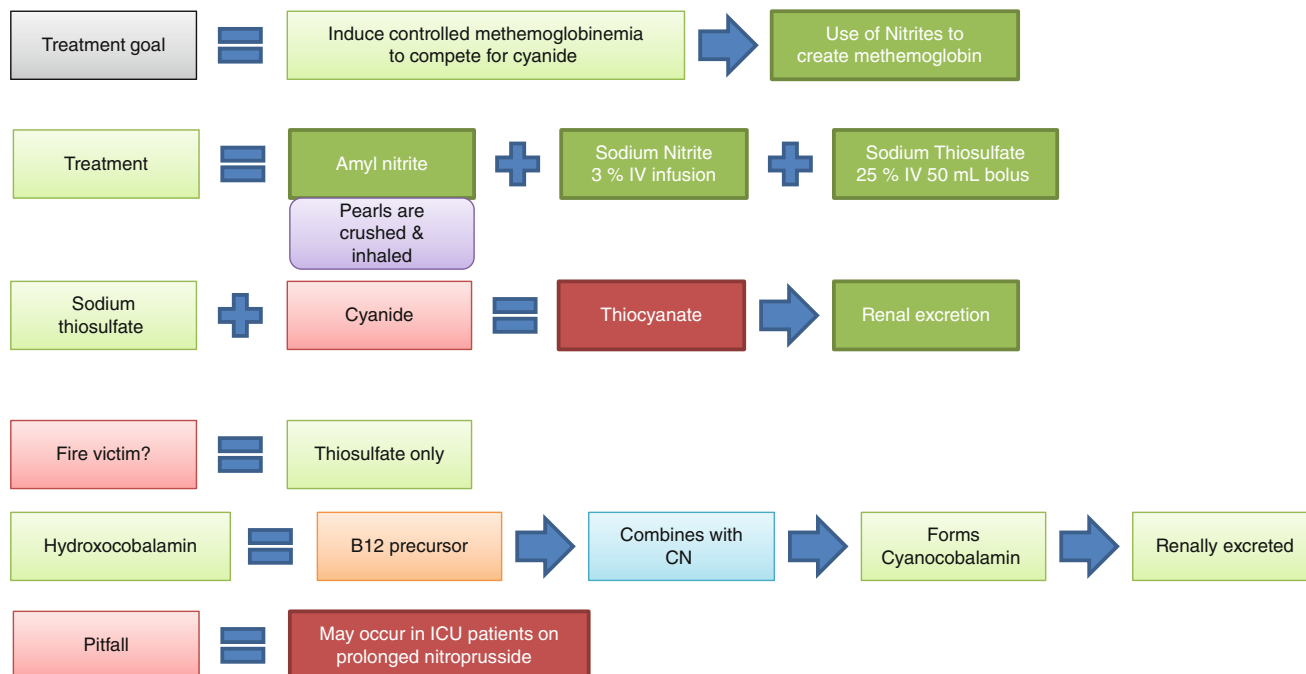
Cyanide and Nitriles



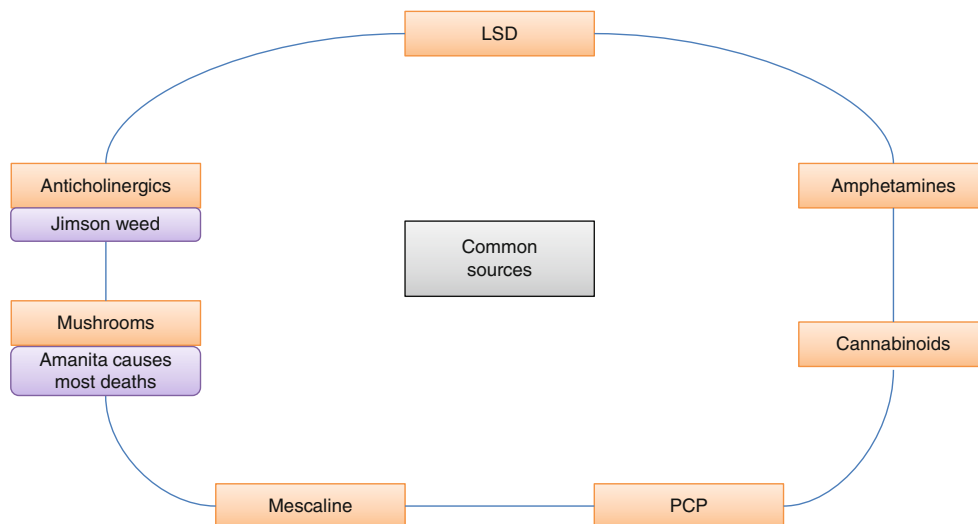
Cyanide



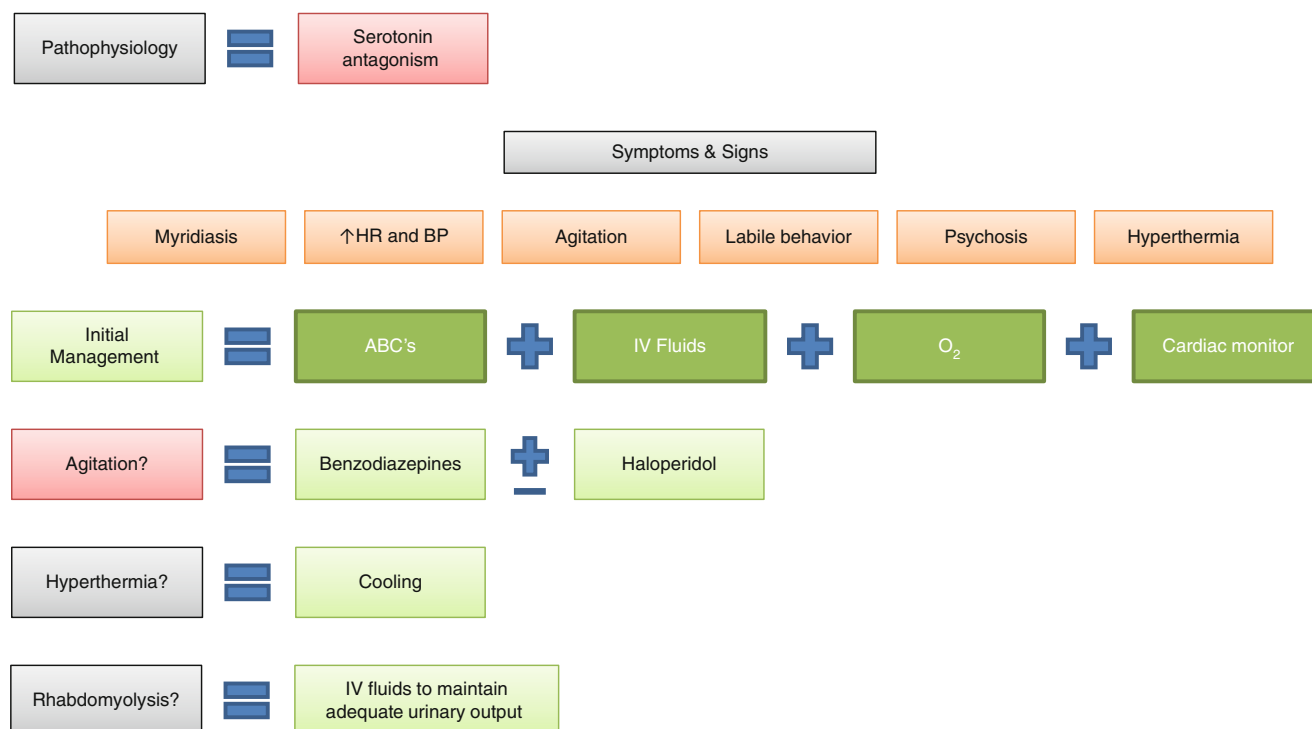
Cyanide Treatment



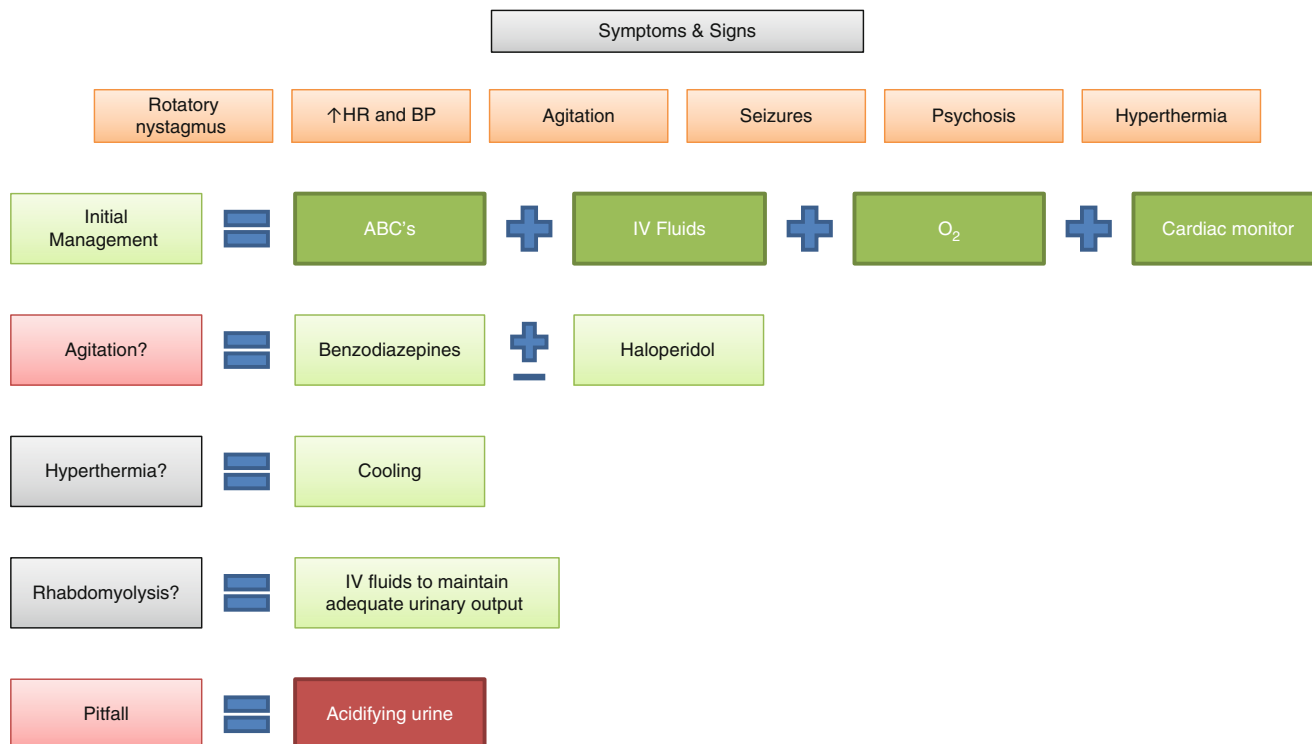
Hallucinogens



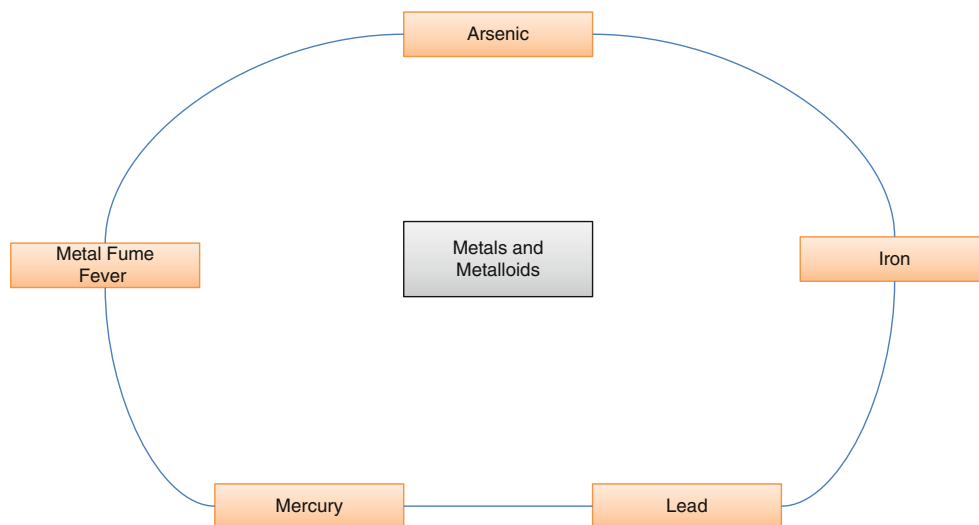
Hallucinogens



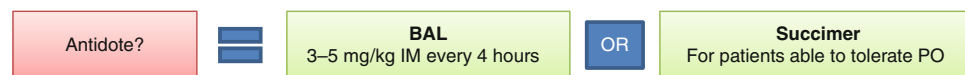
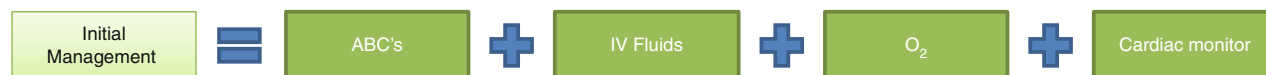
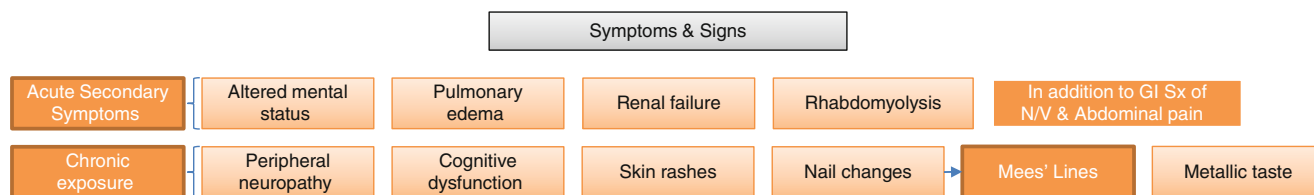
Phencyclidine (PCP)



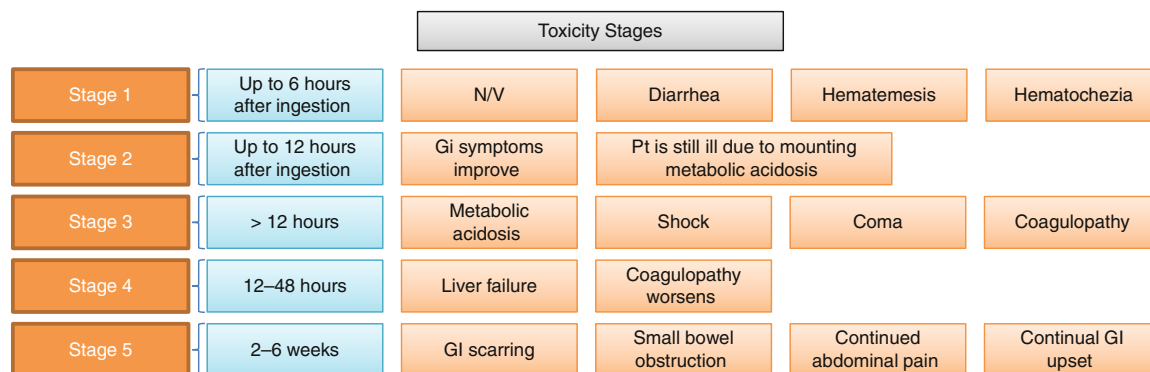
Metals and Metalloids



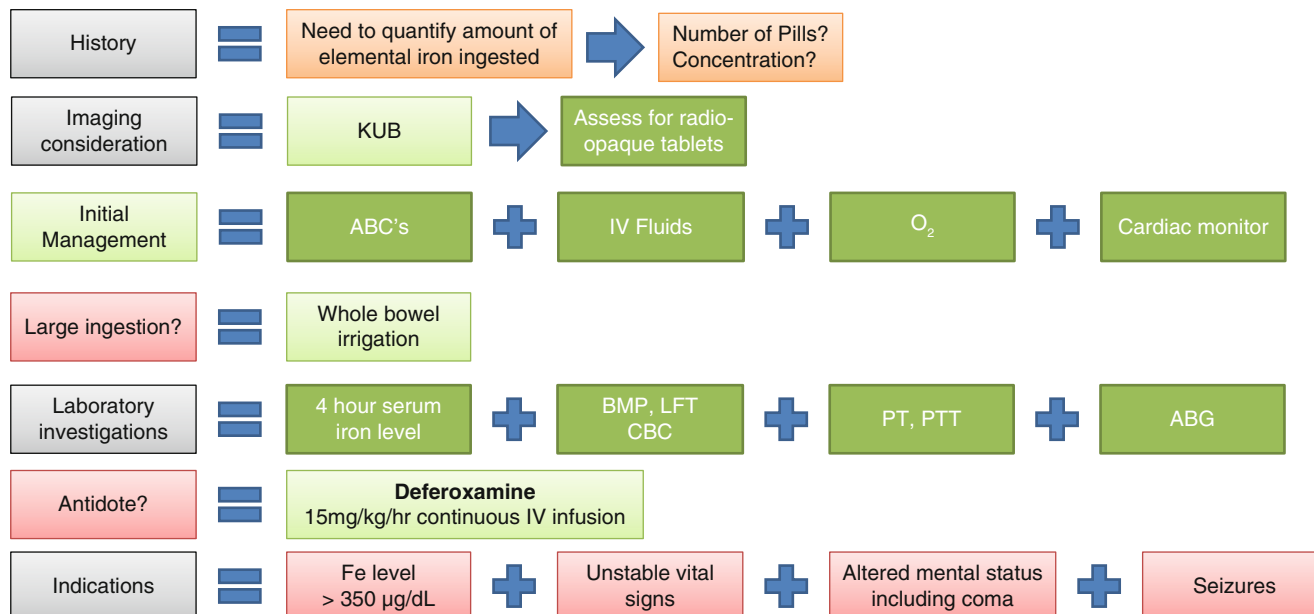
Arsenic

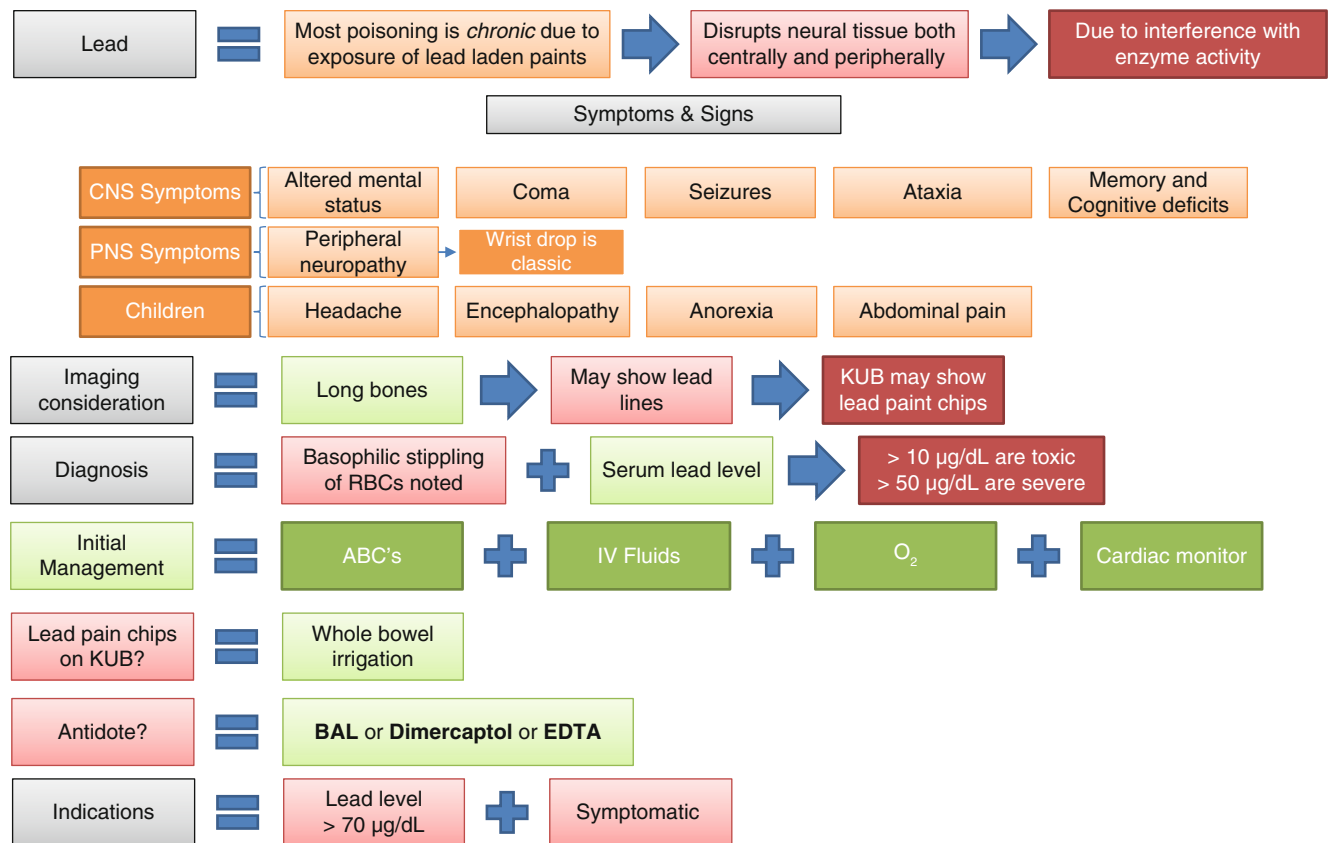


Iron

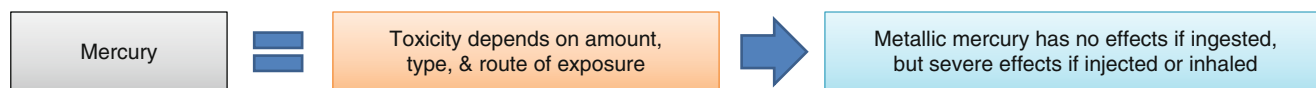


Iron Treatment and Management

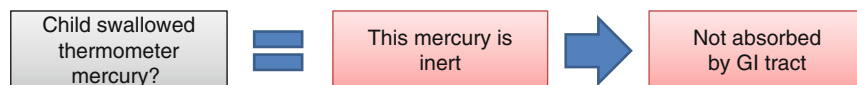
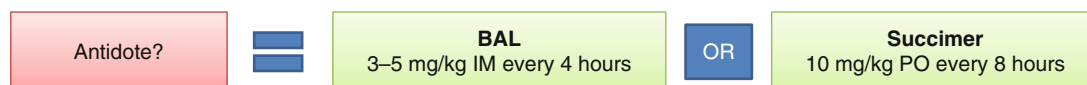
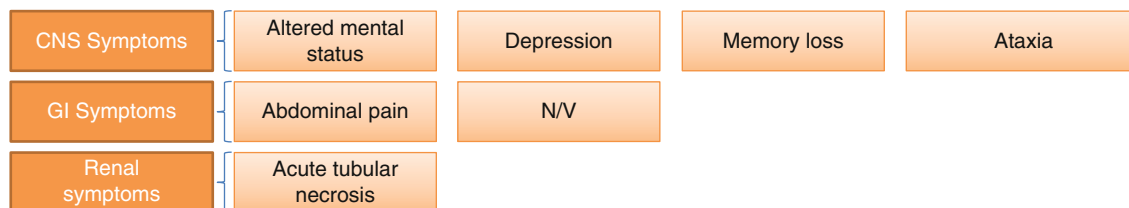


Lead

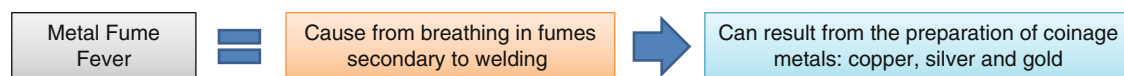
Mercury



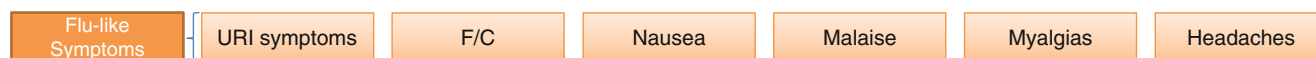
Symptoms & Signs



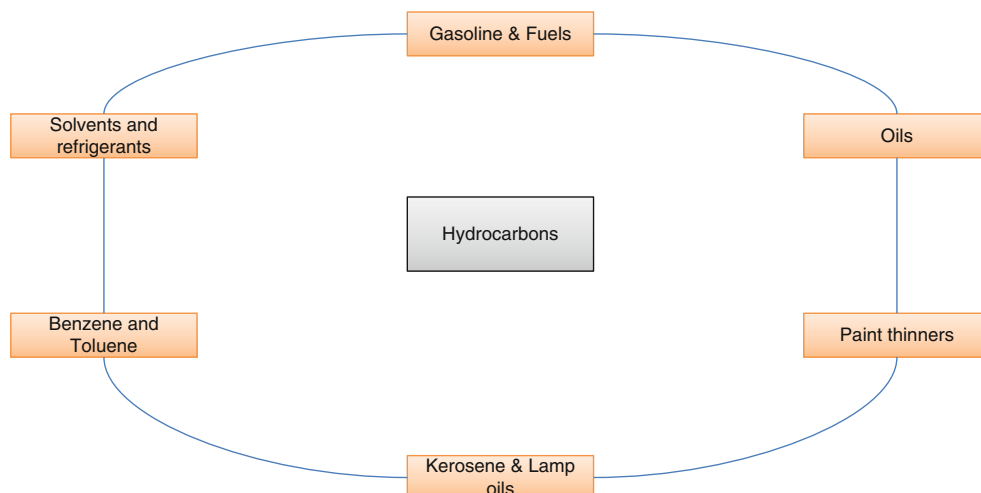
Metal Fume Fever



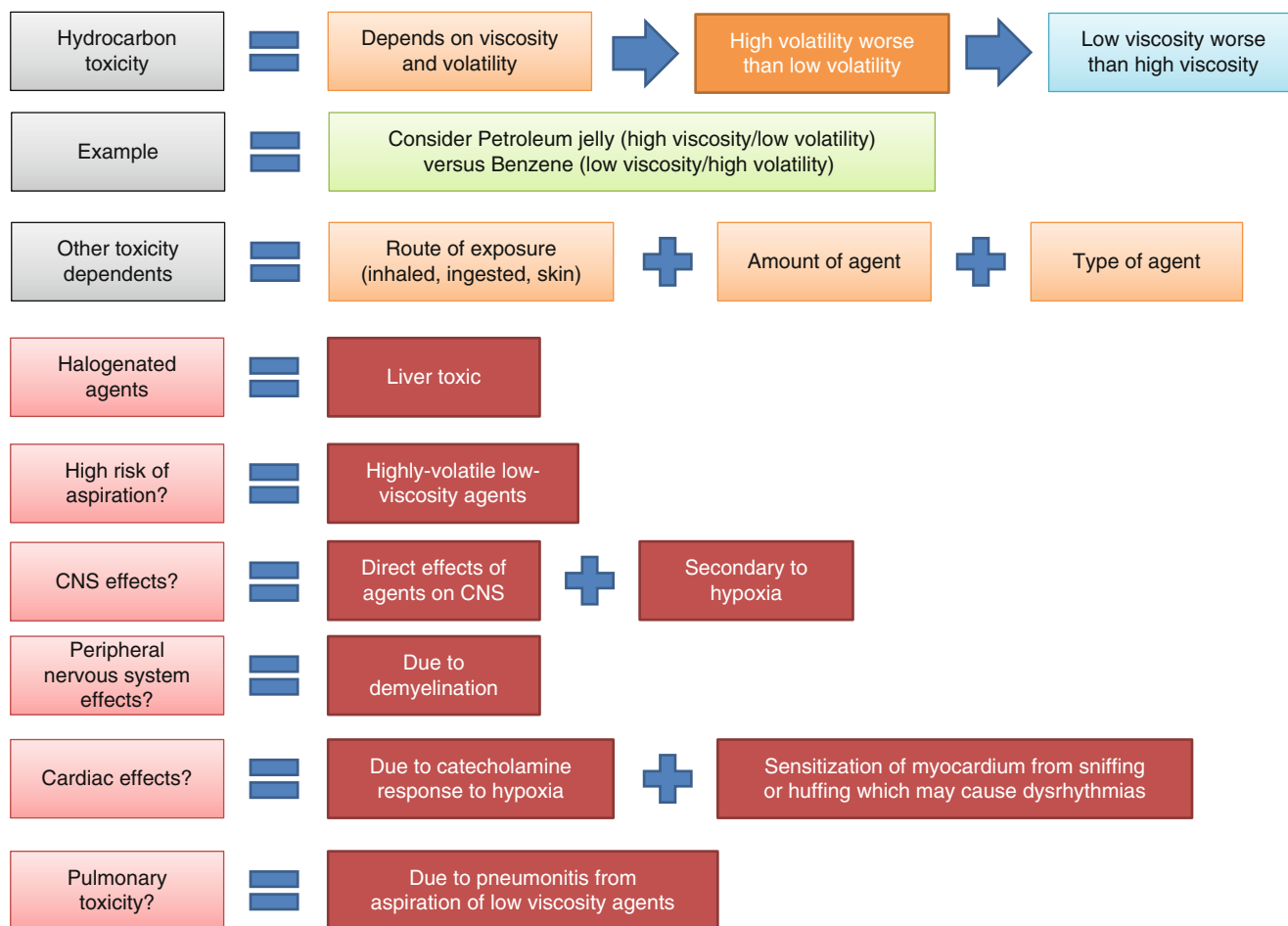
Symptoms & Signs



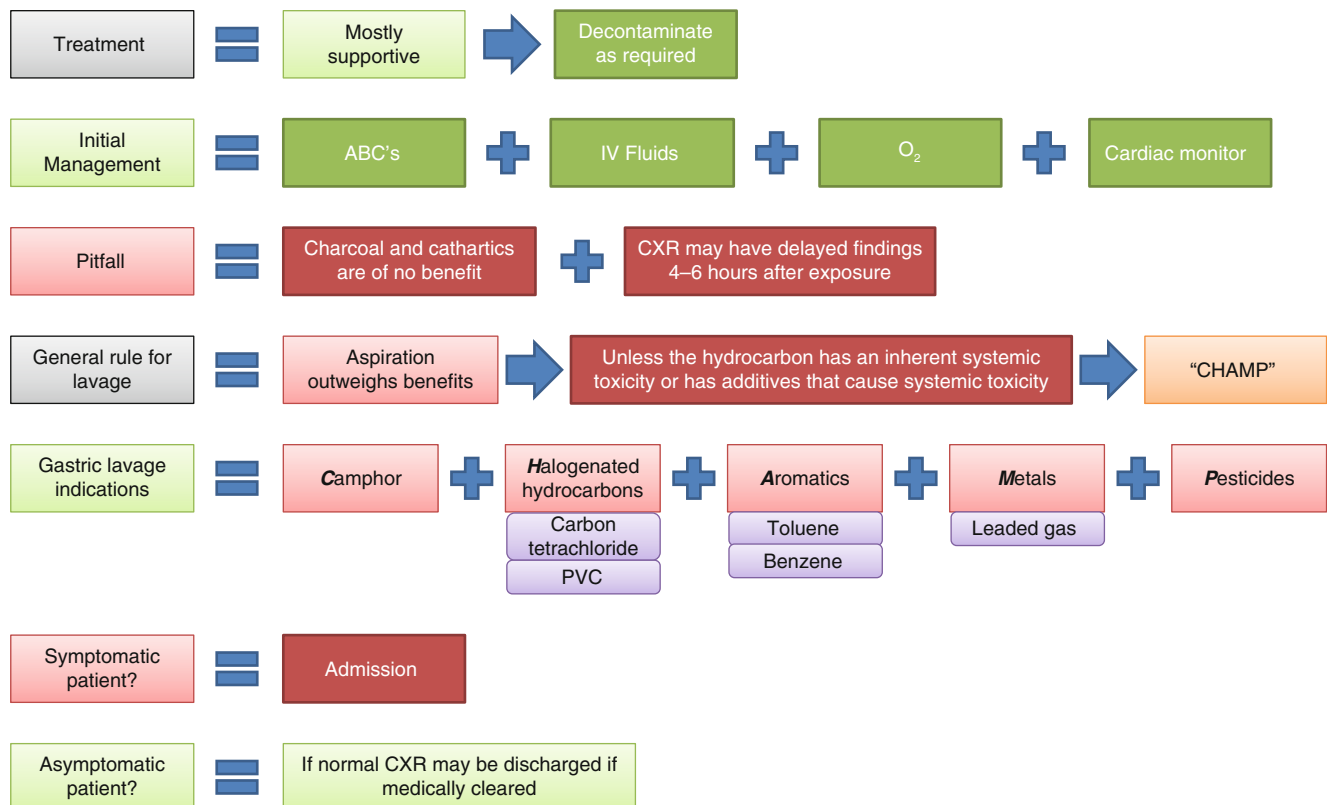
Hydrocarbons



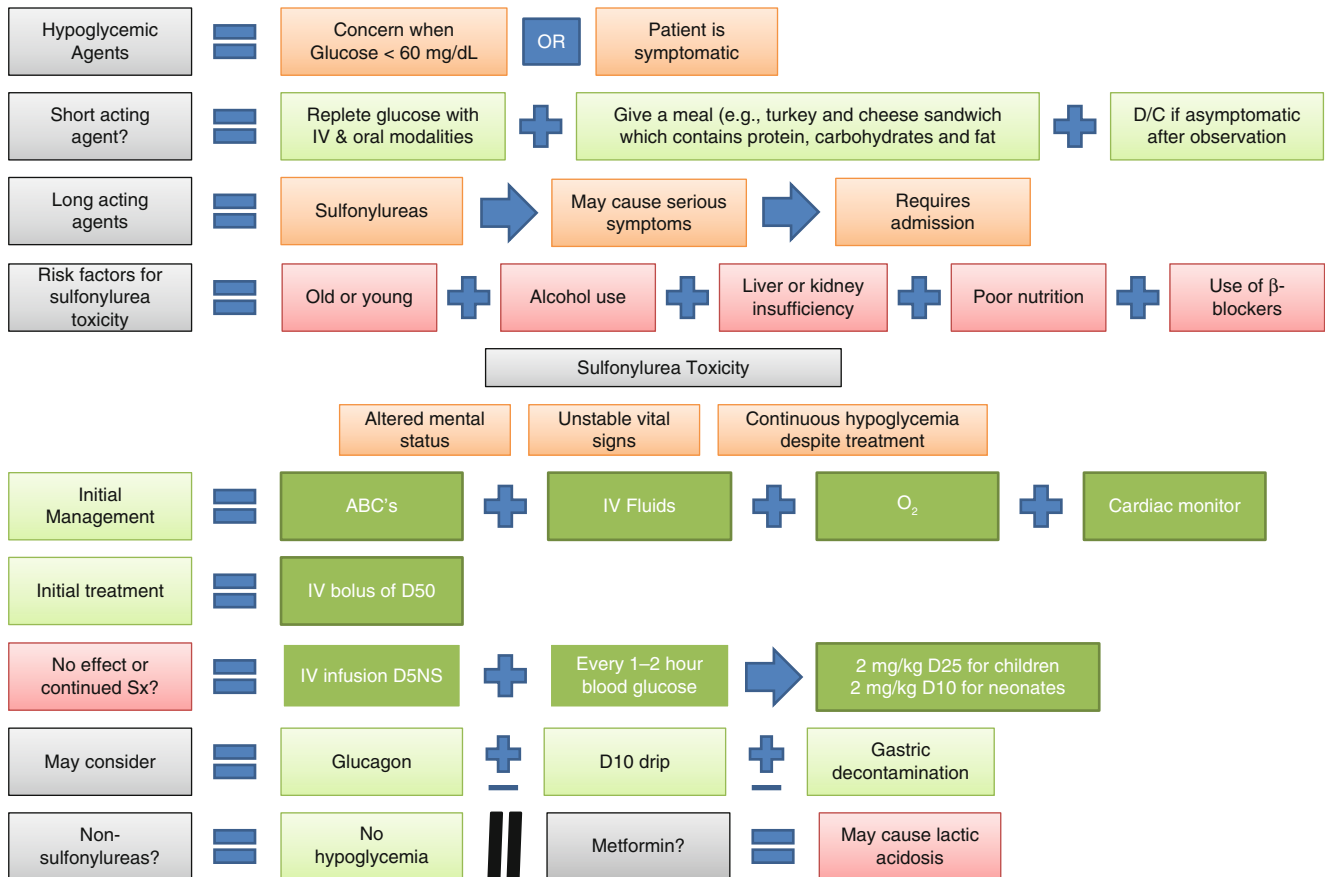
Hydrocarbons: Introduction



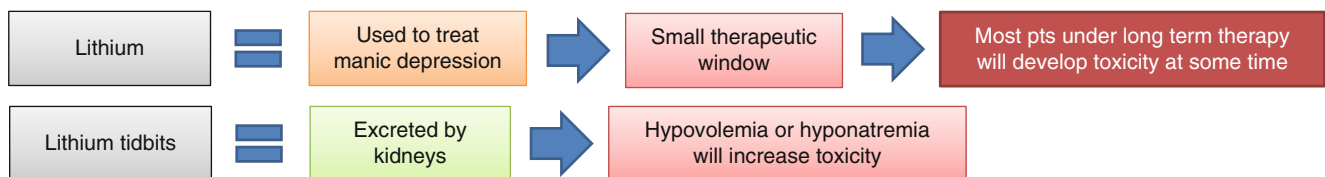
Hydrocarbon: Treatment and Management



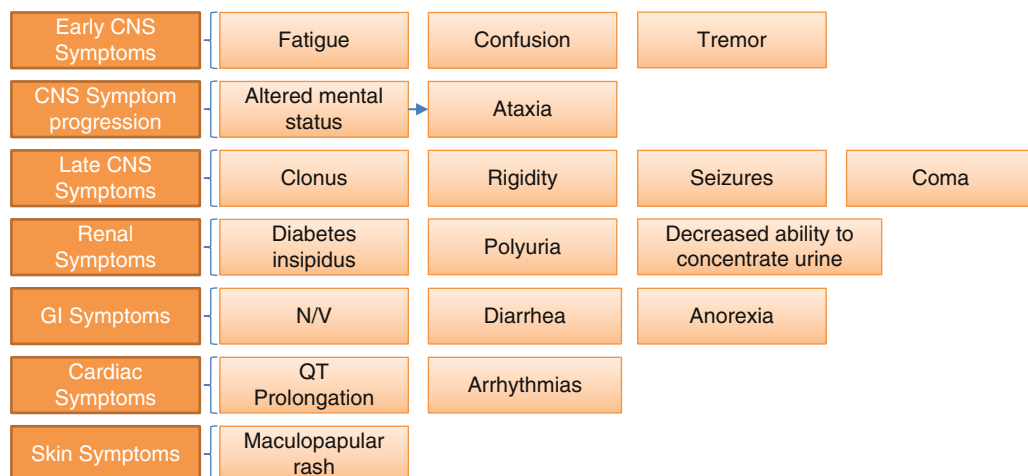
Hypoglycemic Agents



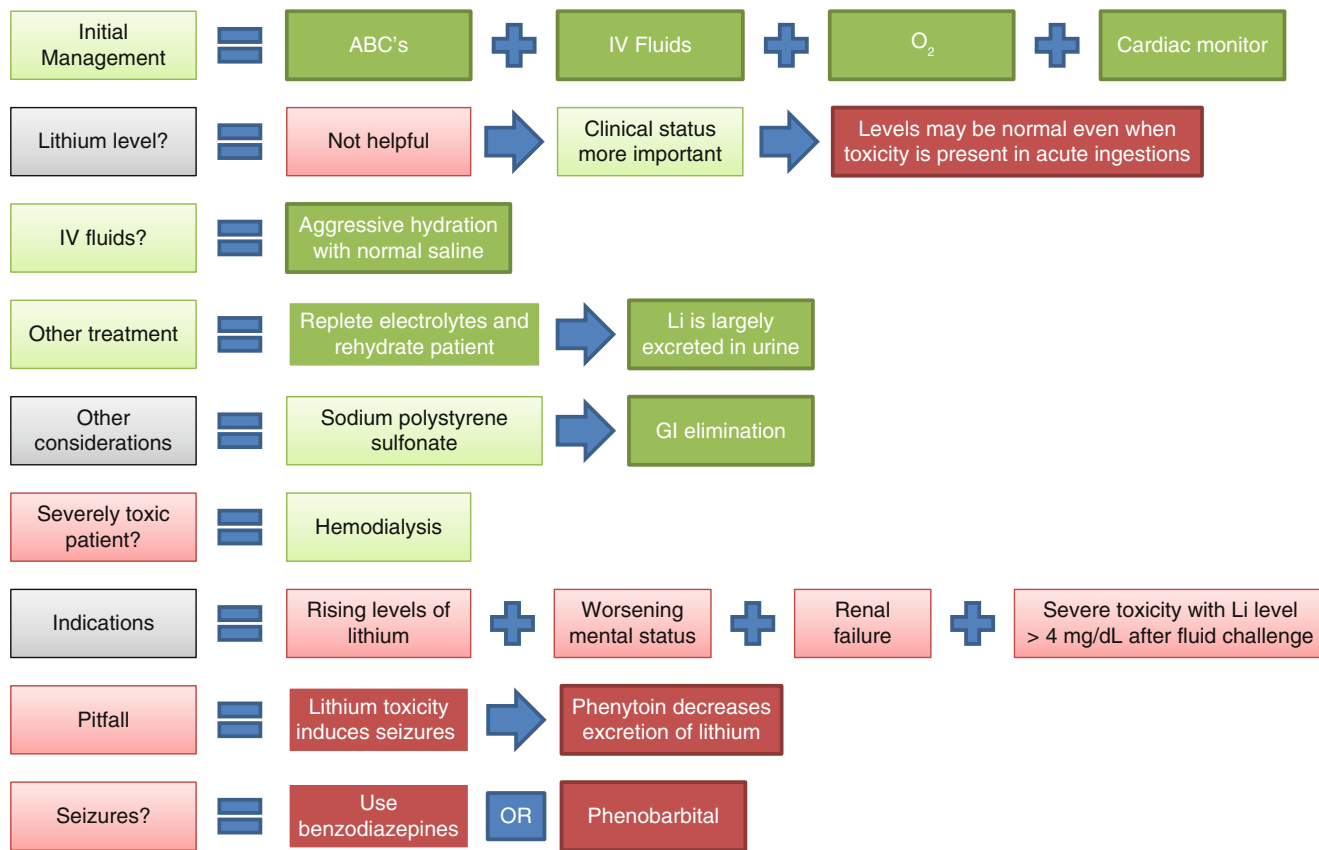
Lithium



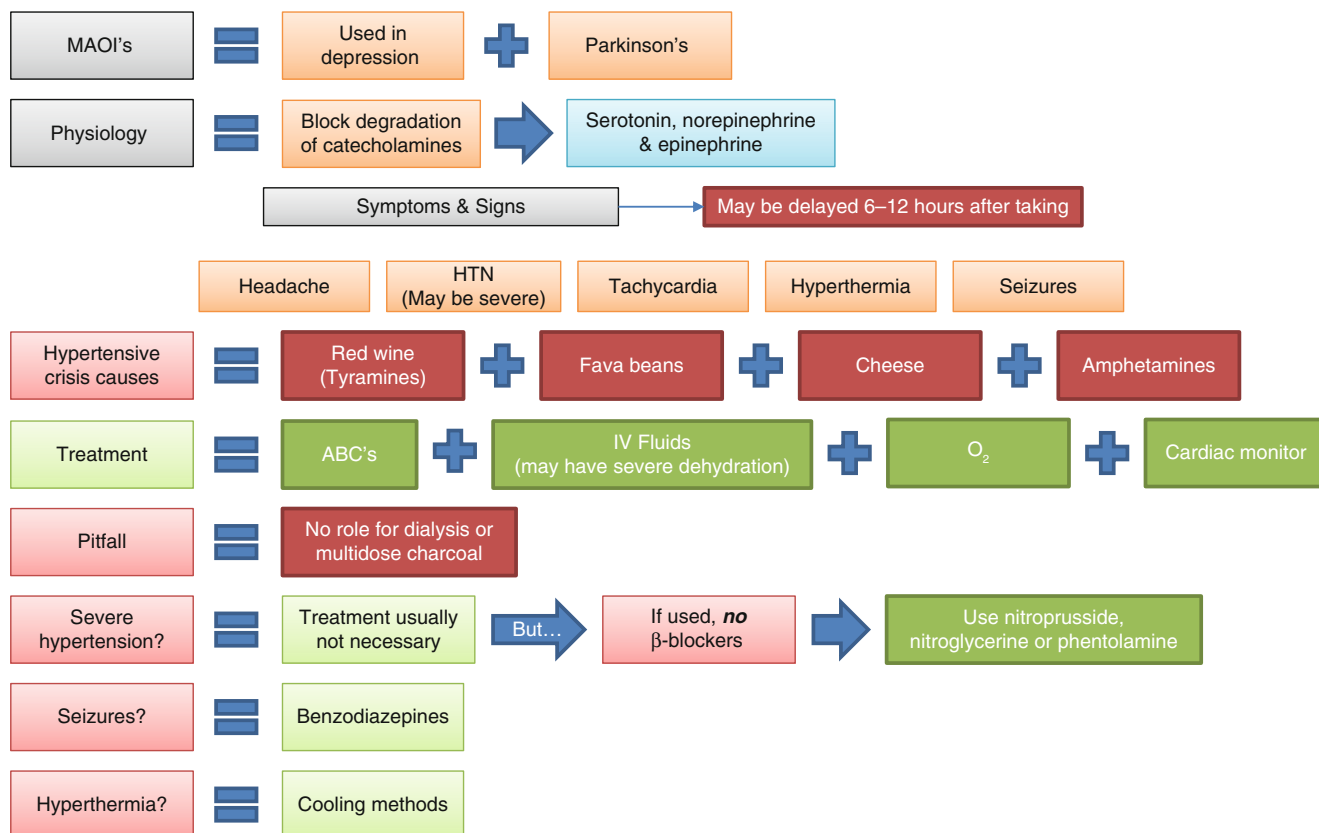
Symptoms & Signs



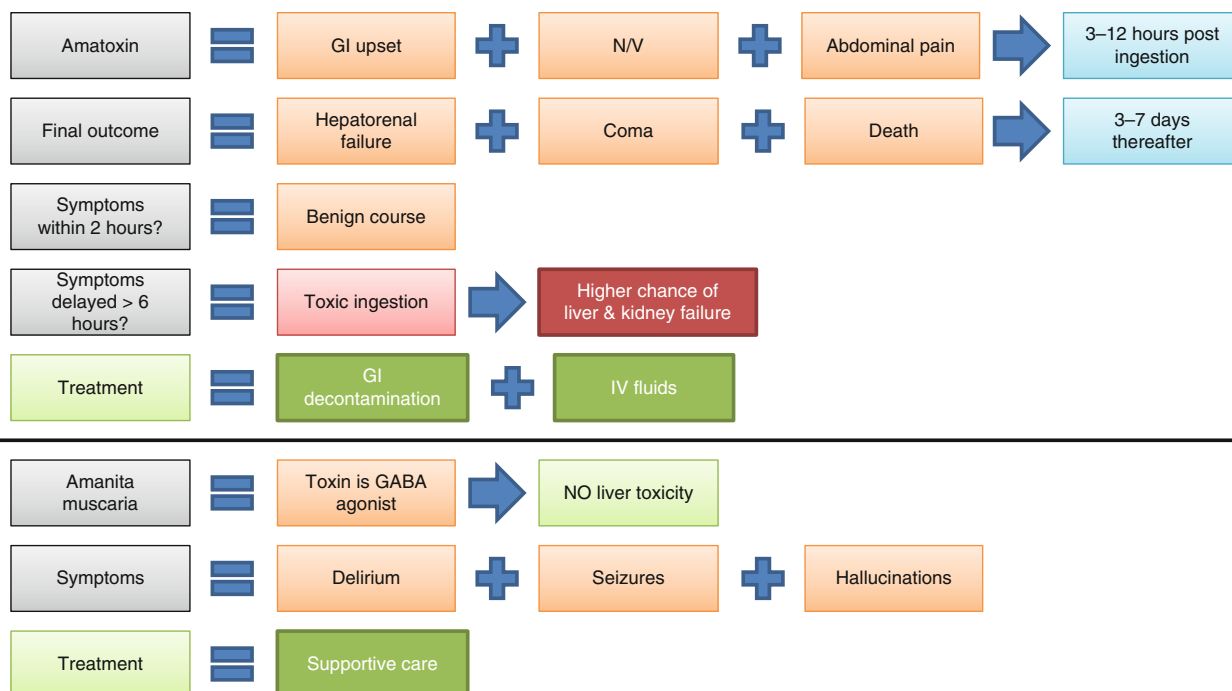
Lithium Toxicity Treatment



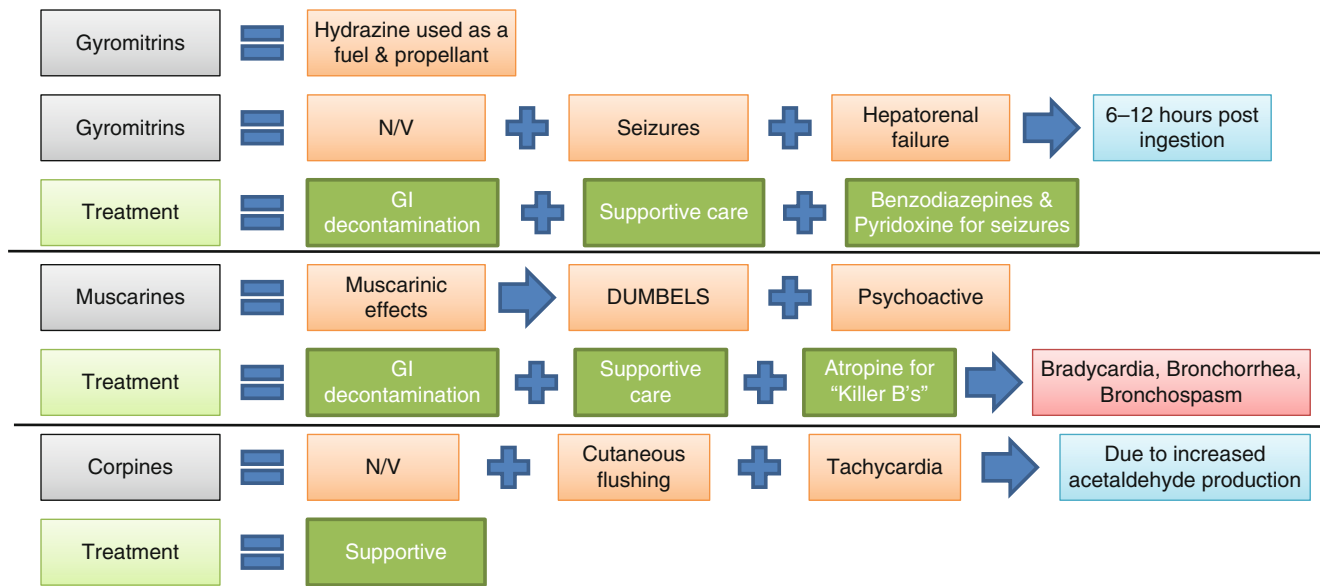
Monoamine Oxidase Inhibitor (MAOI) Overdose



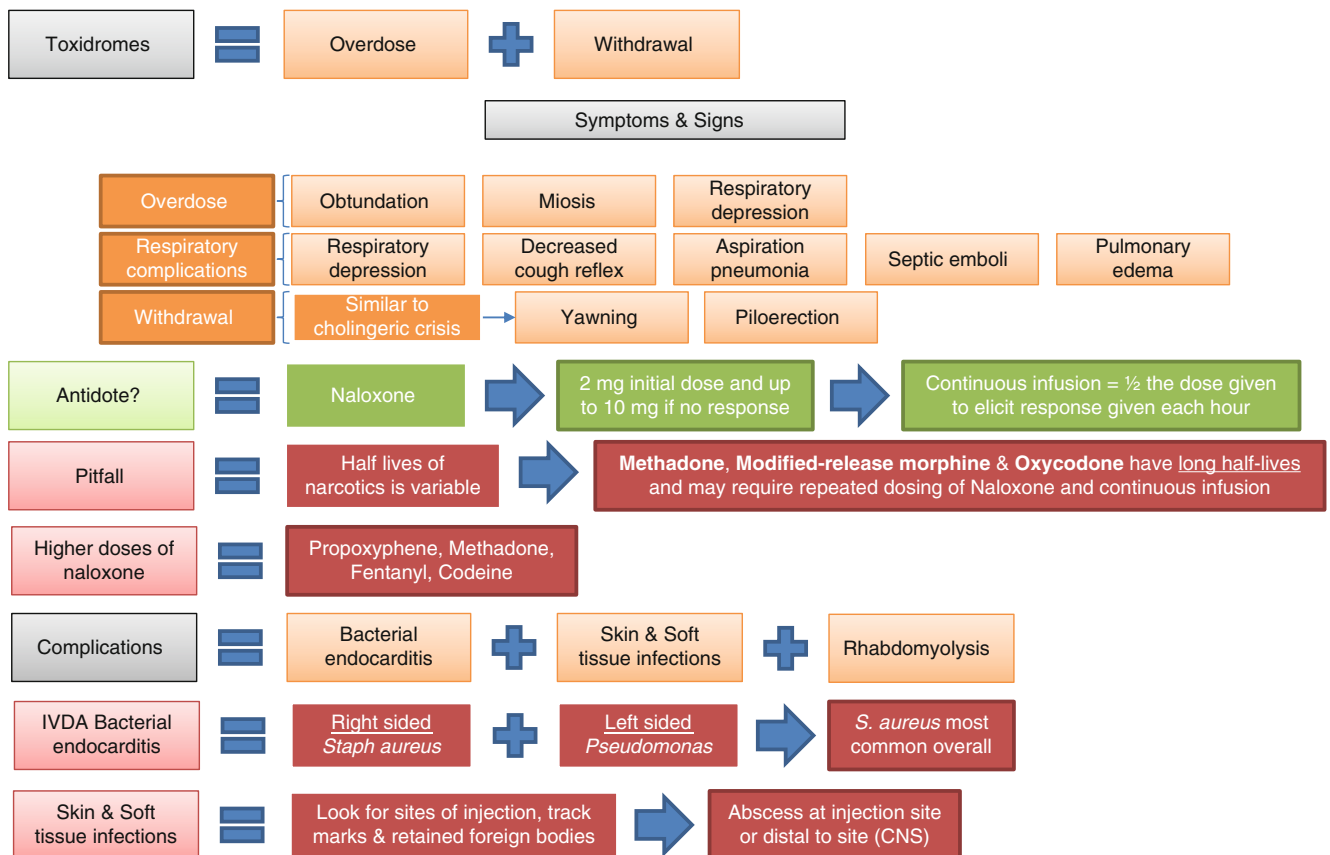
Mushrooms: *Amanita*



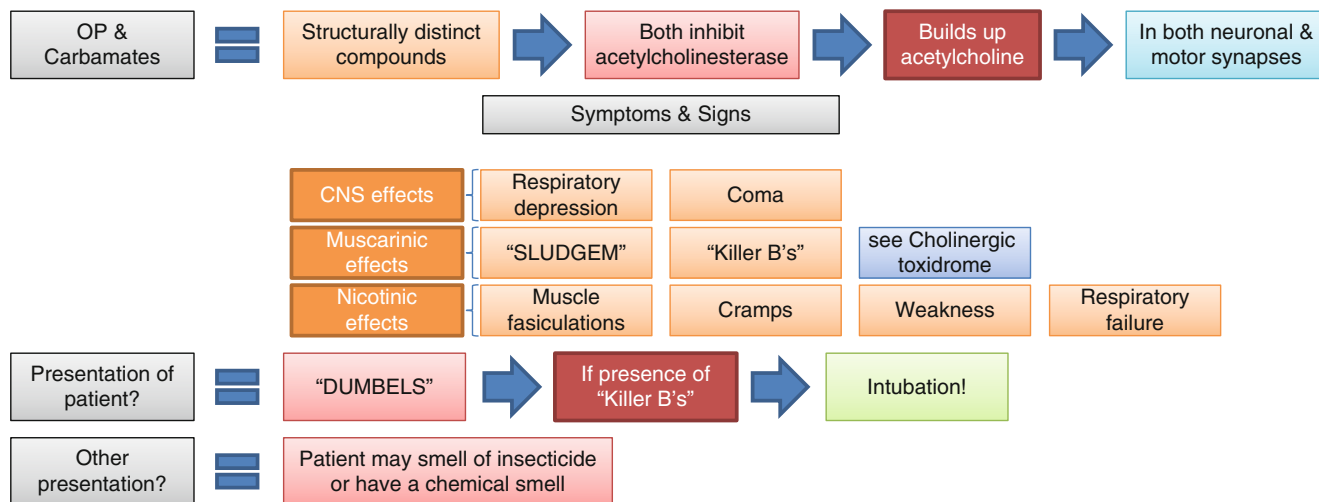
Mushrooms: Others



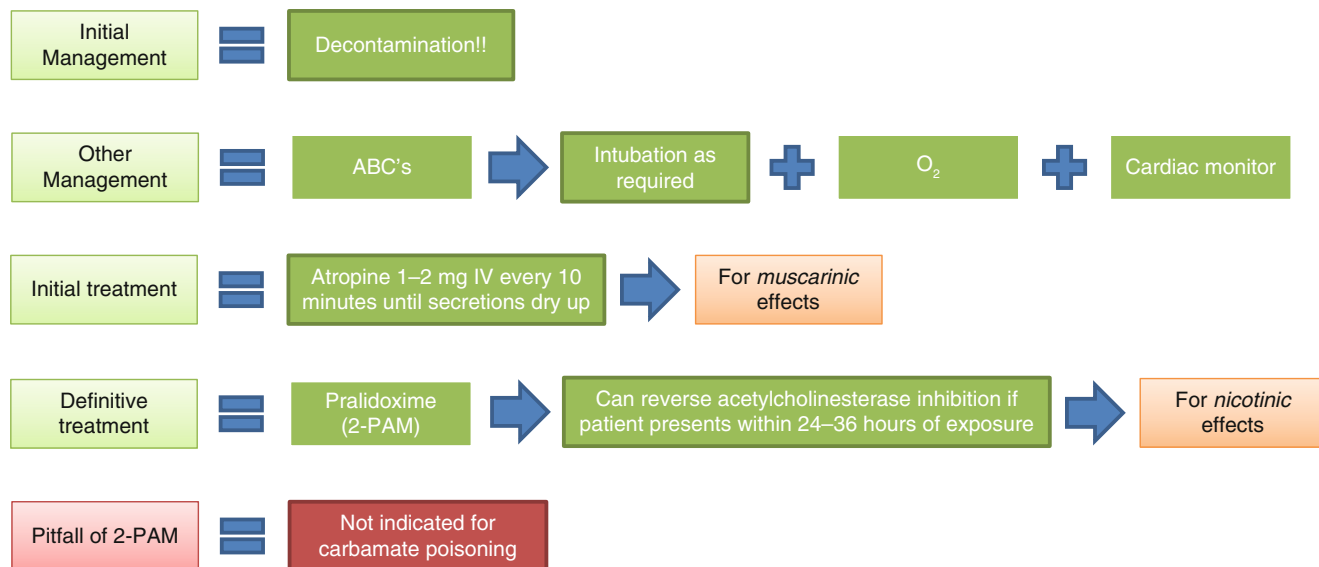
Narcotics



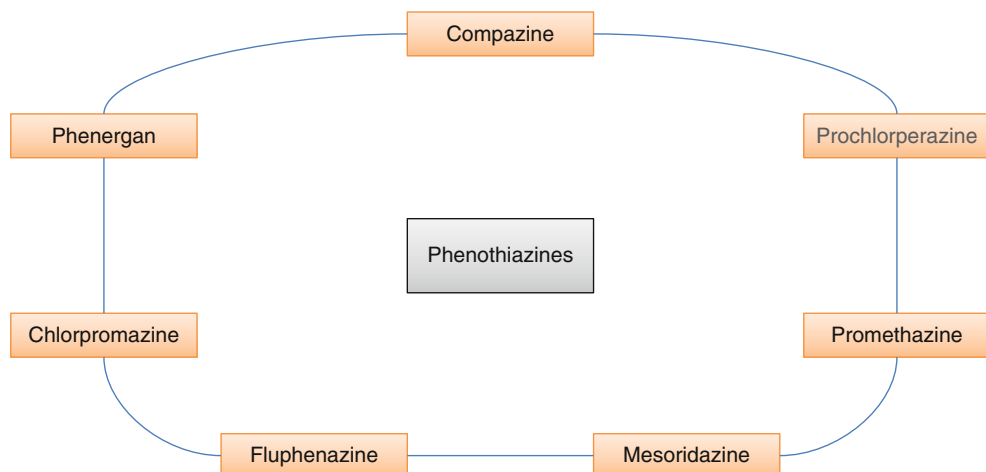
Organophosphates (OP) and Carbamates



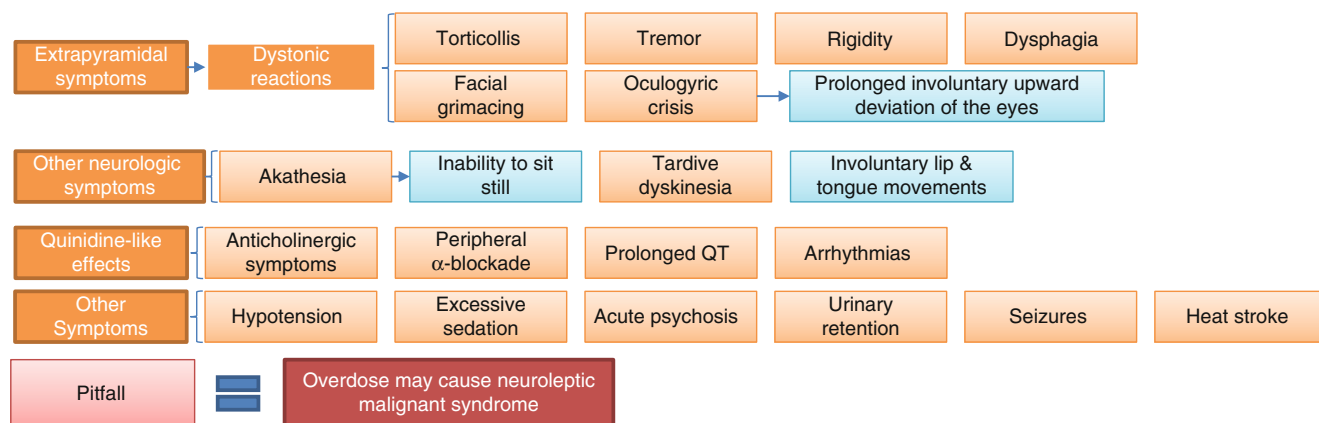
Treatment and Management



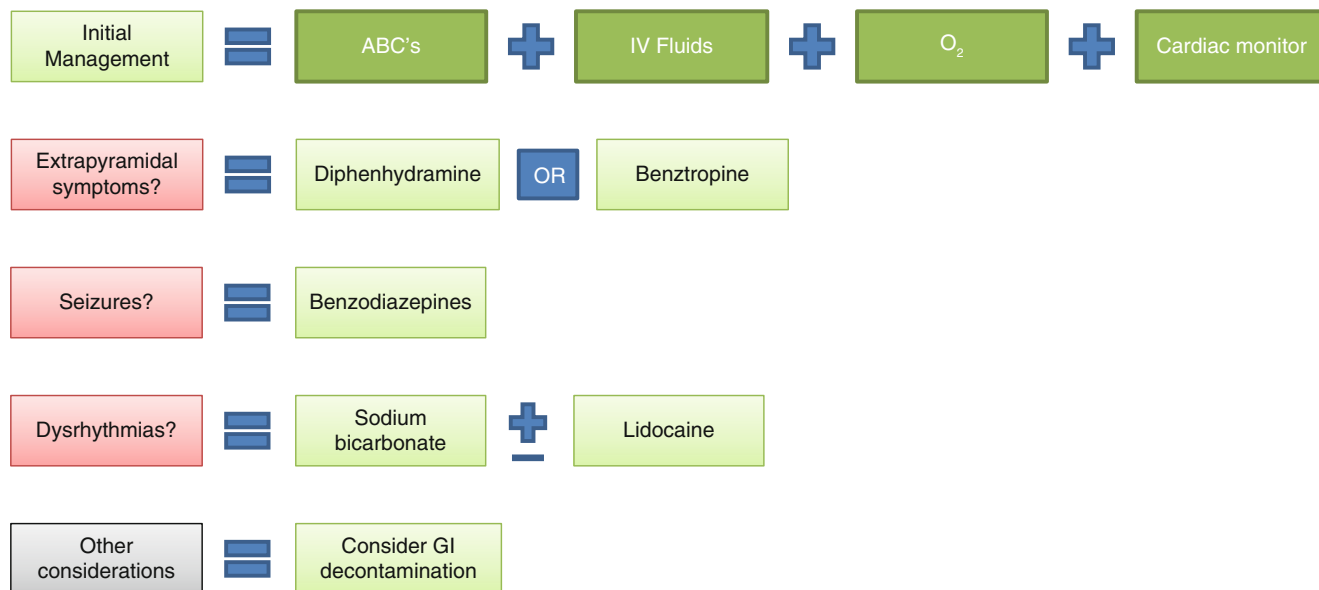
Phenothiazines



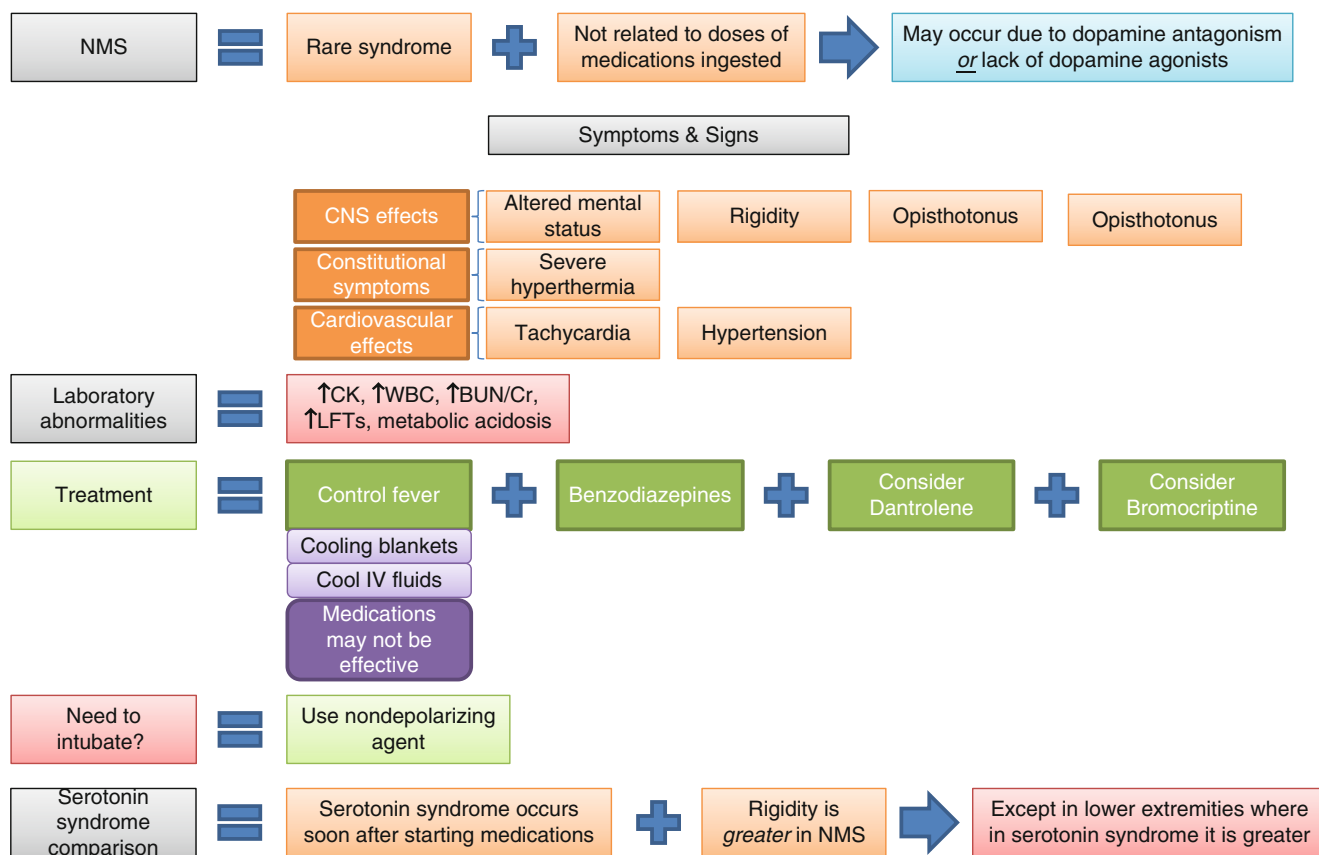
Symptoms & Signs



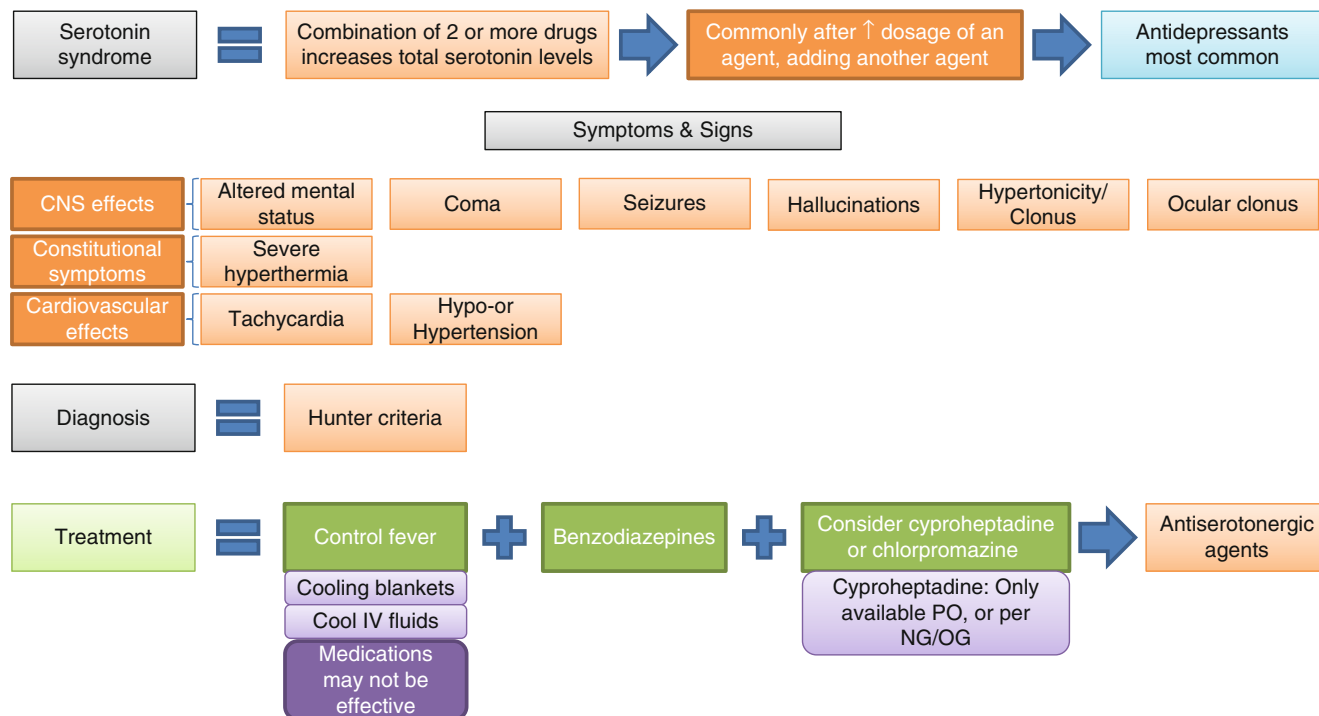
Treatment and Management



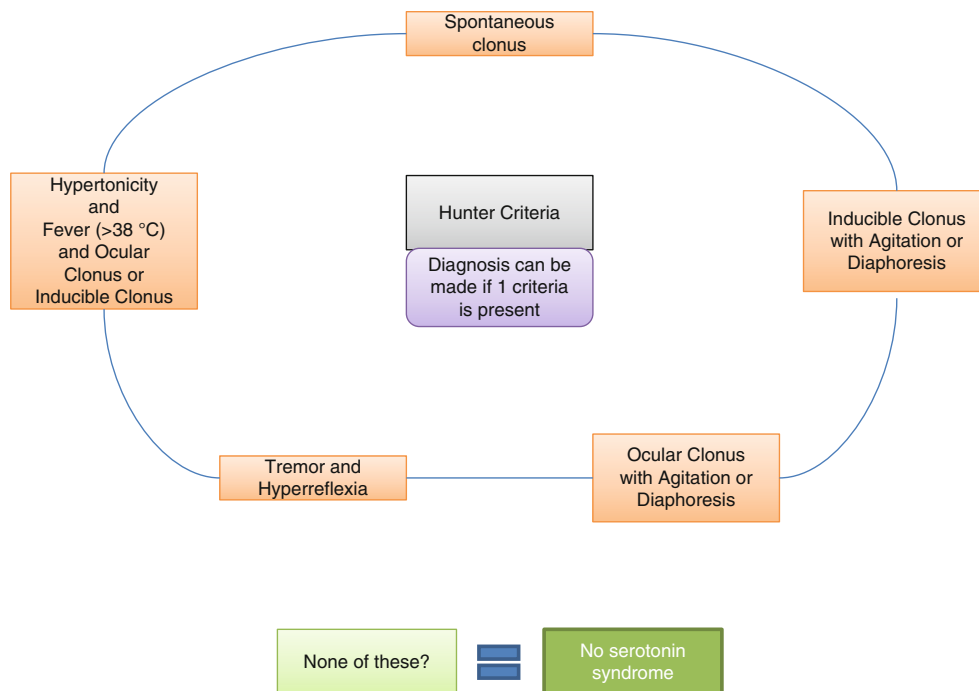
Neuroleptic Malignant Syndrome (NMS)



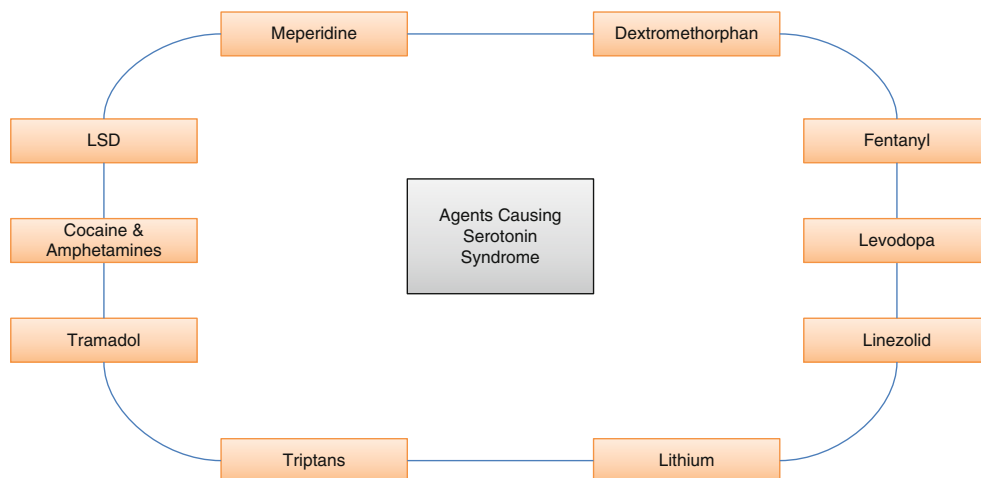
Serotonin Syndrome



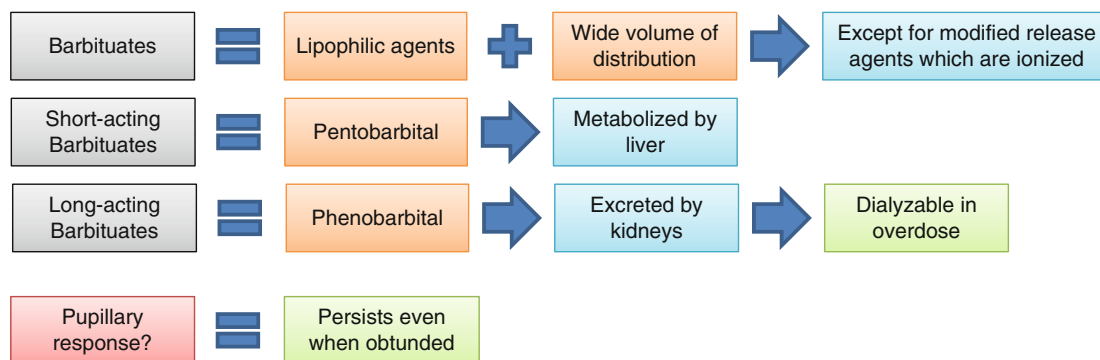
Hunter Criteria for Serotonin Syndrome



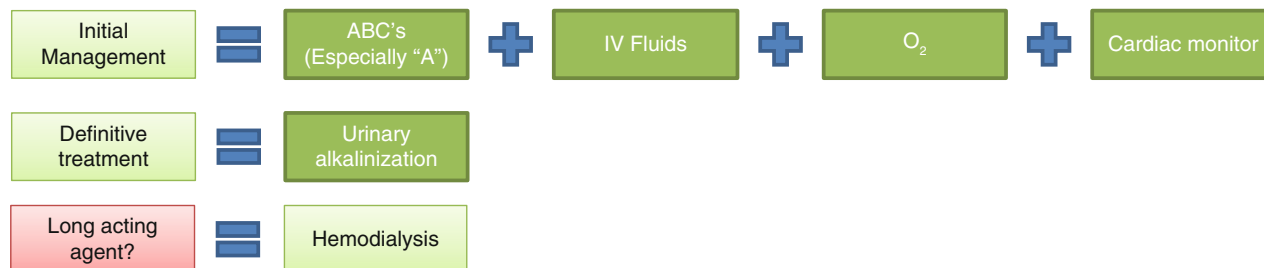
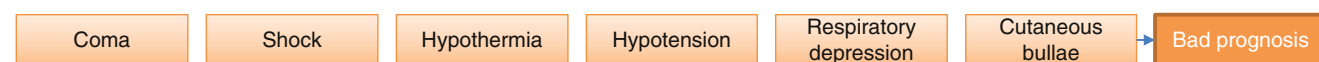
Agents Causing Serotonin Syndrome



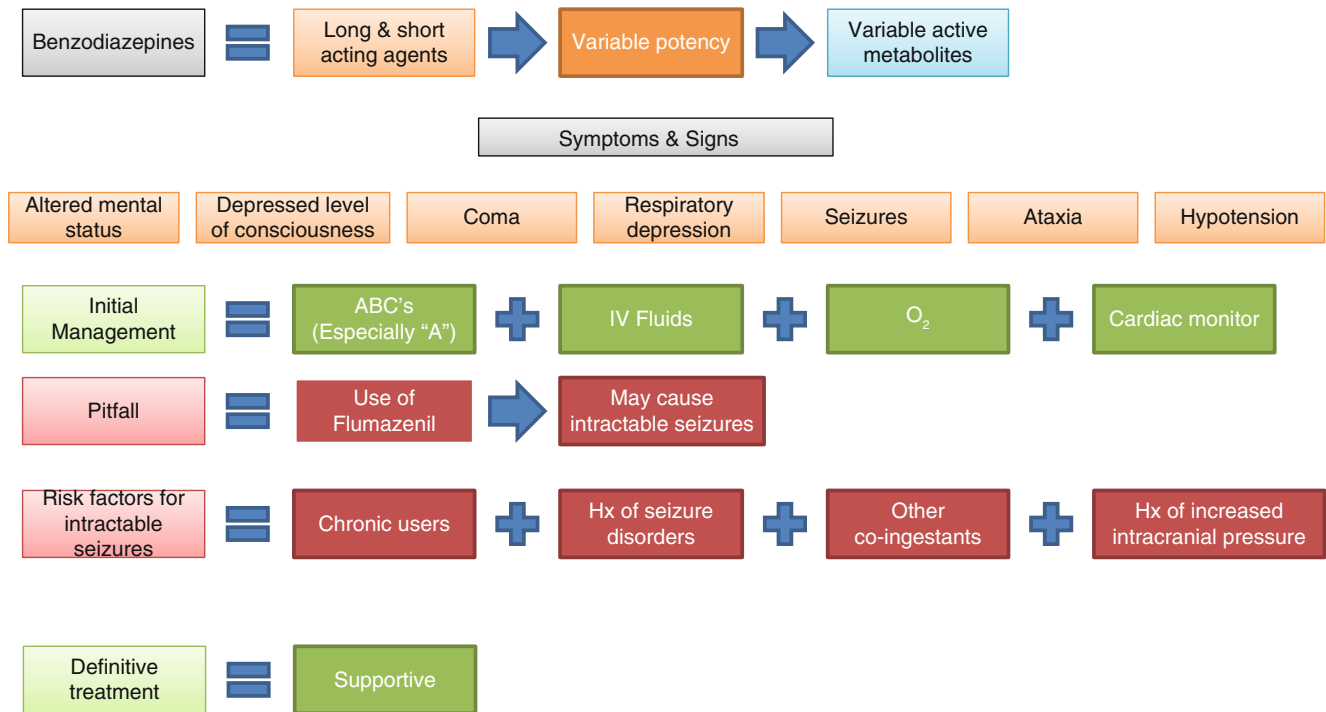
Sedative-Hypnotics: Barbiturates



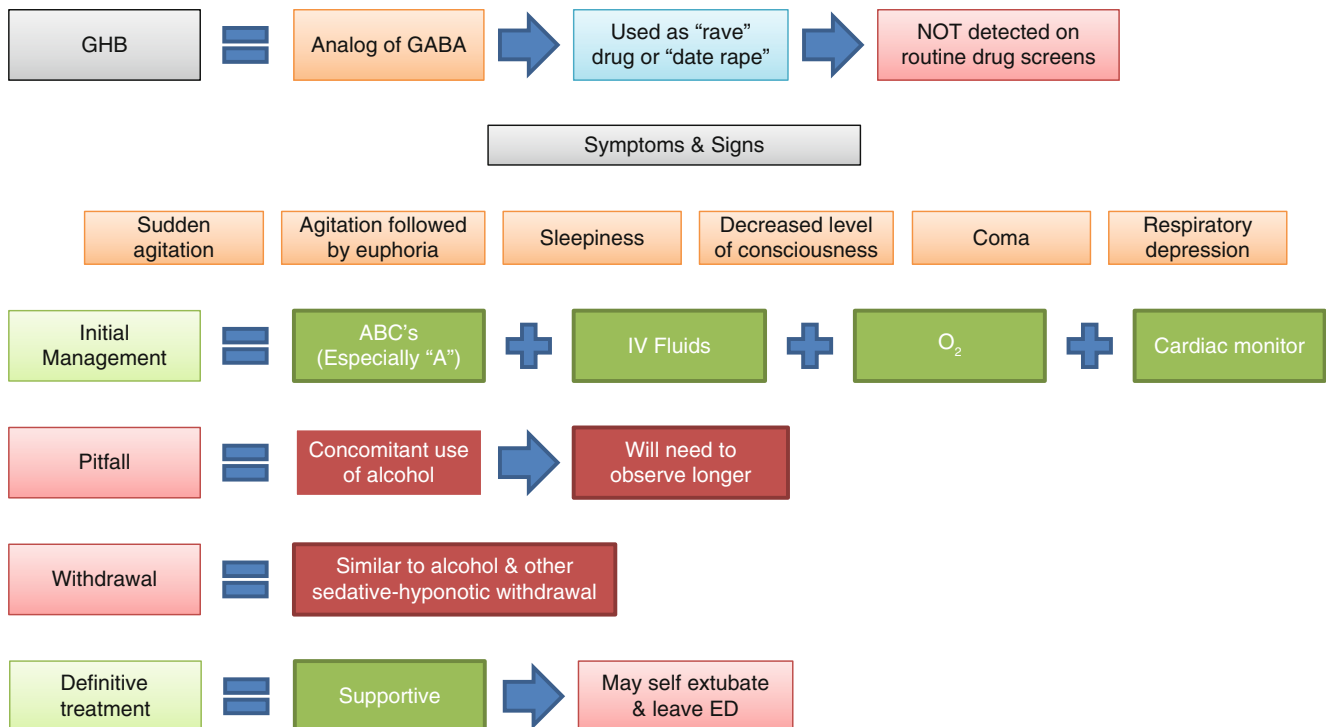
Symptoms & Signs



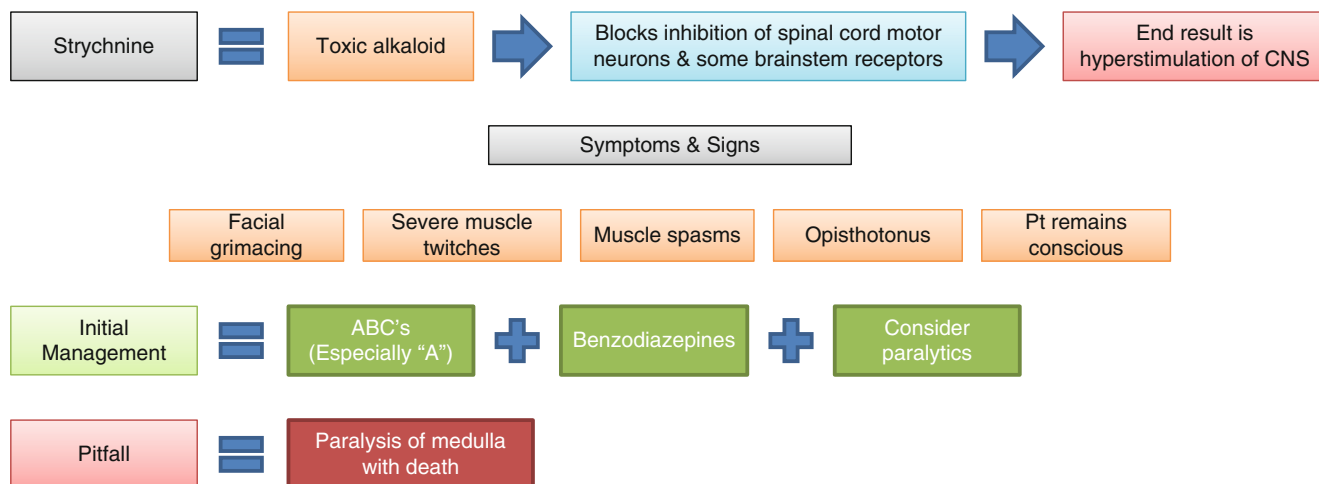
Sedative-Hypnotics: Benzodiazepines



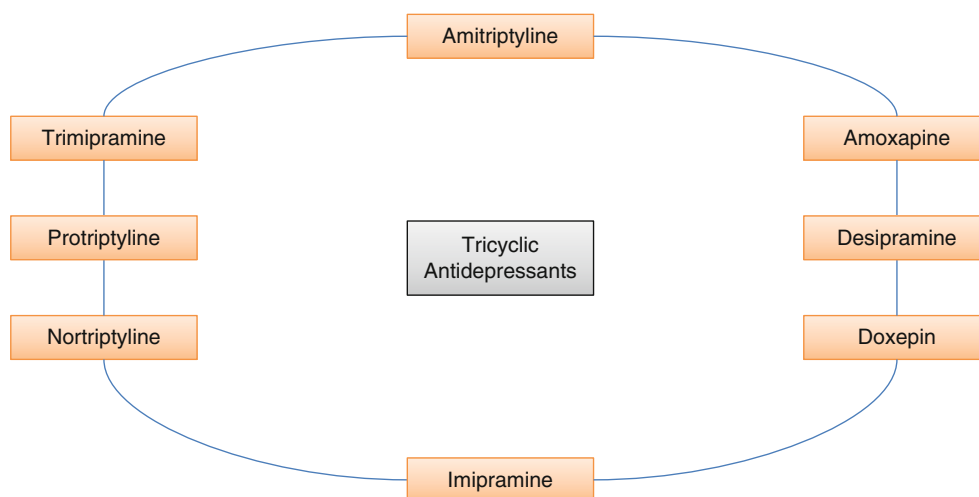
Sedative-Hypnotics: Gamma-Hydroxybutyrate (GHB)



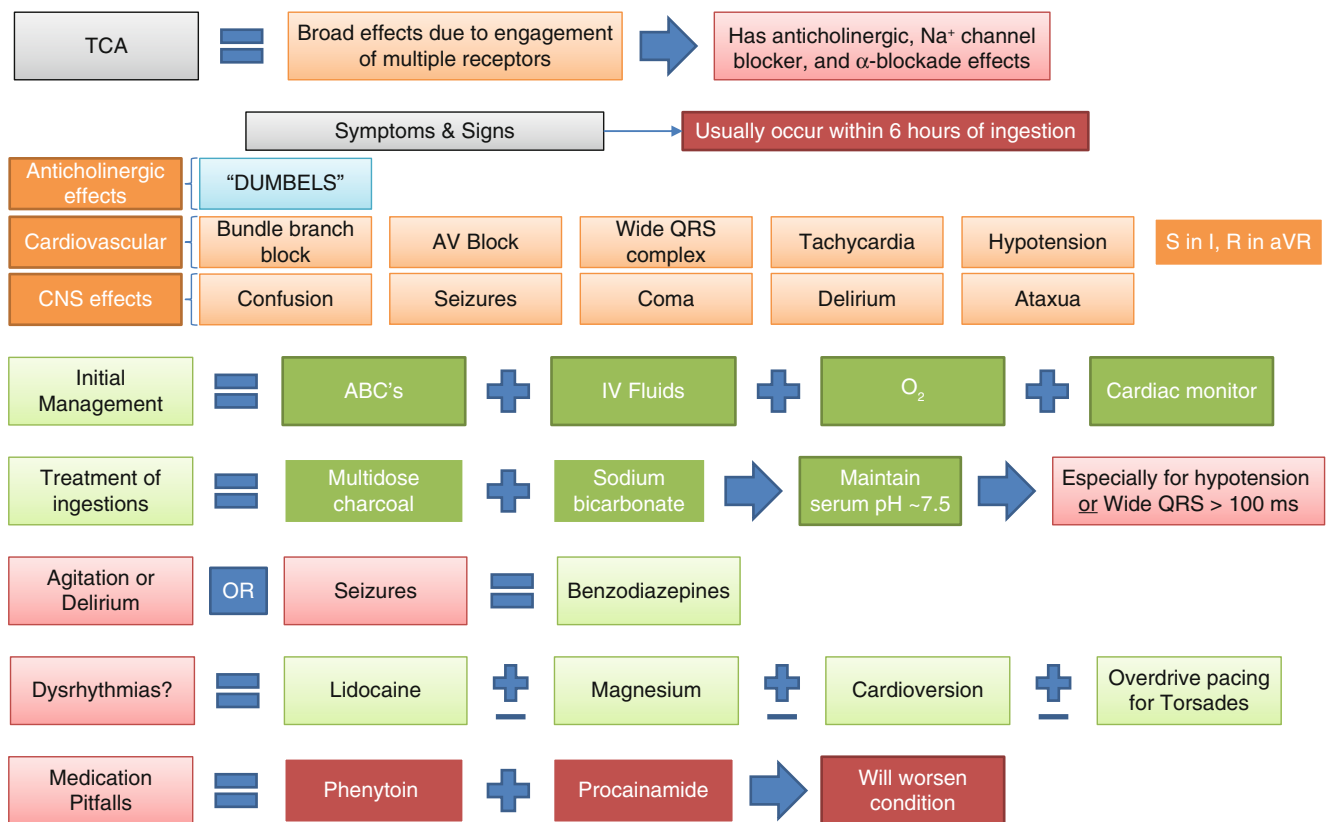
Strychnine Toxicity



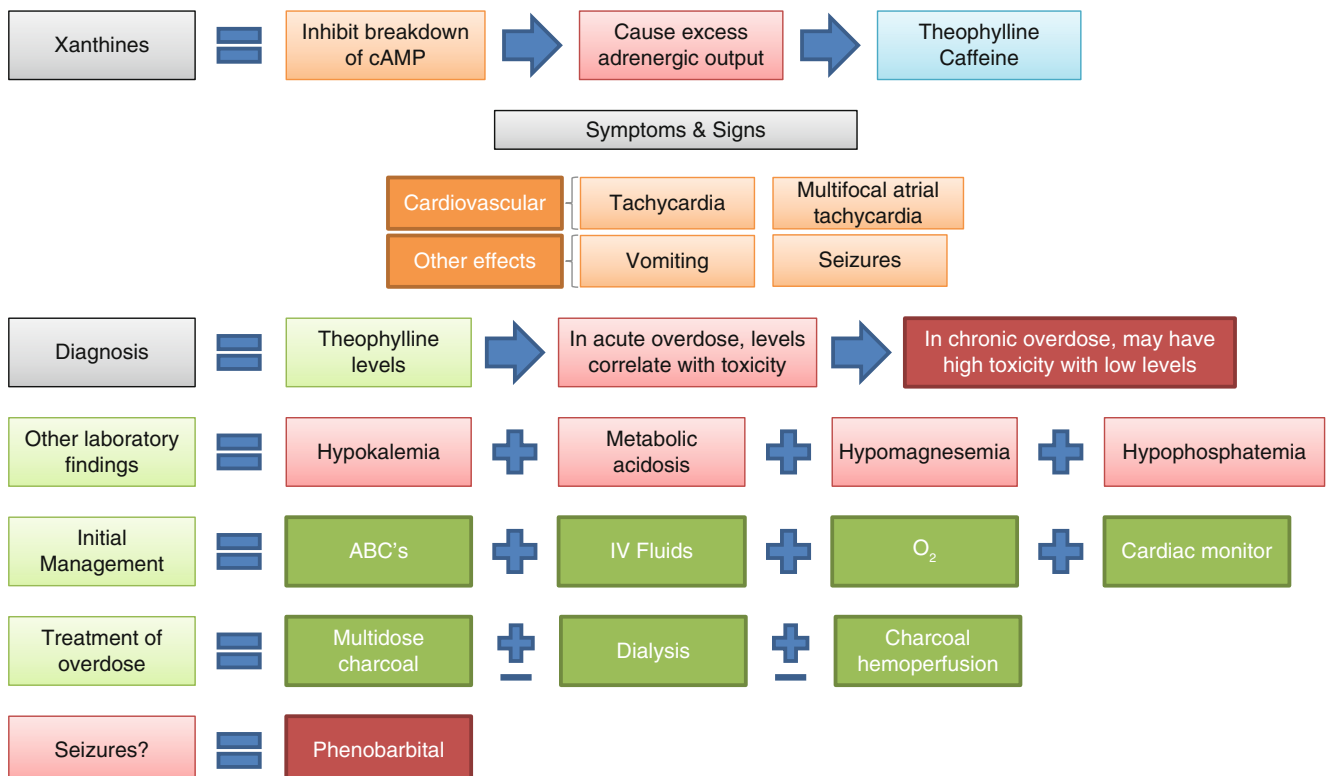
Tricyclic Antidepressants (TCA)



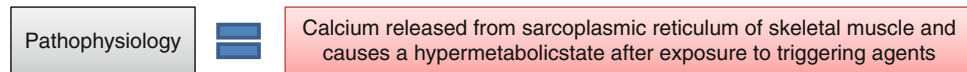
Tricyclic Antidepressants (TCA)



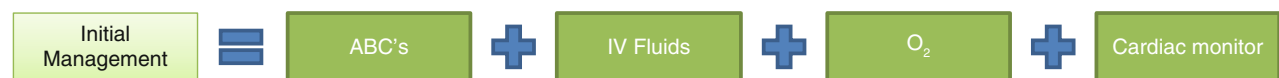
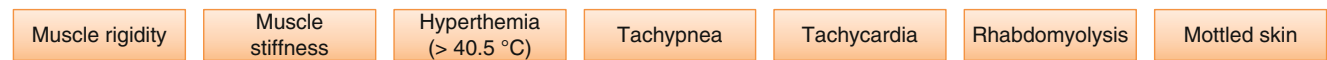
Xanthines



Malignant Hyperthermia



Symptoms & Signs



Orthopedic Emergencies

Bobby Desai

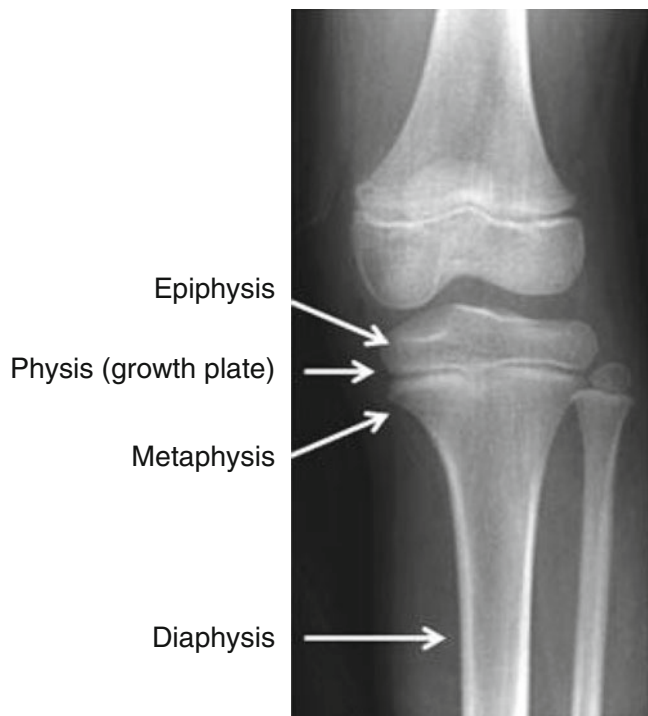
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B. Desai, MD, MEd
Department of Emergency Medicine, University of Florida,
Gainesville, FL, USA
e-mail: bdesai@ufl.edu

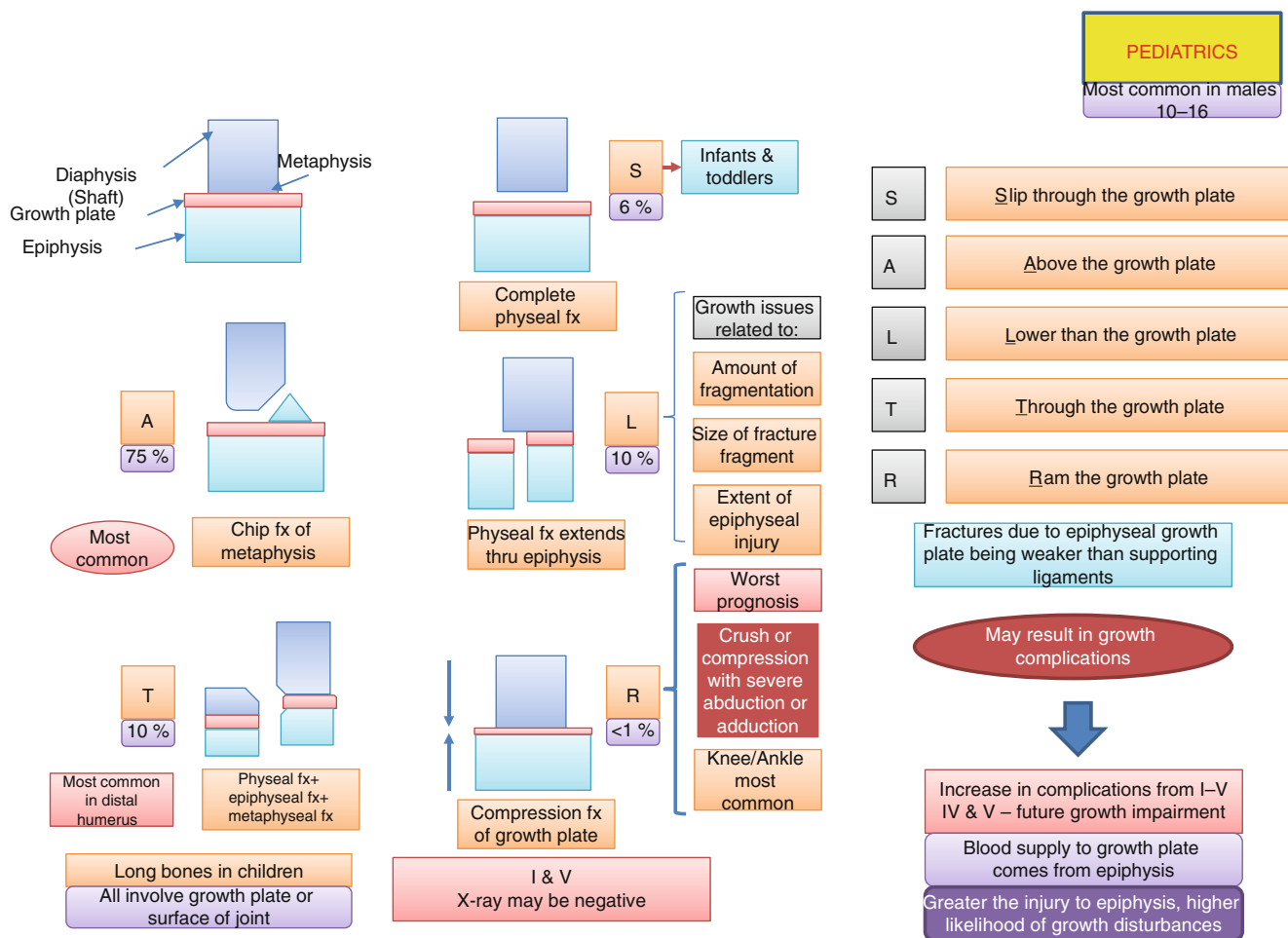
Tidbits

Growing Bone Anatomy



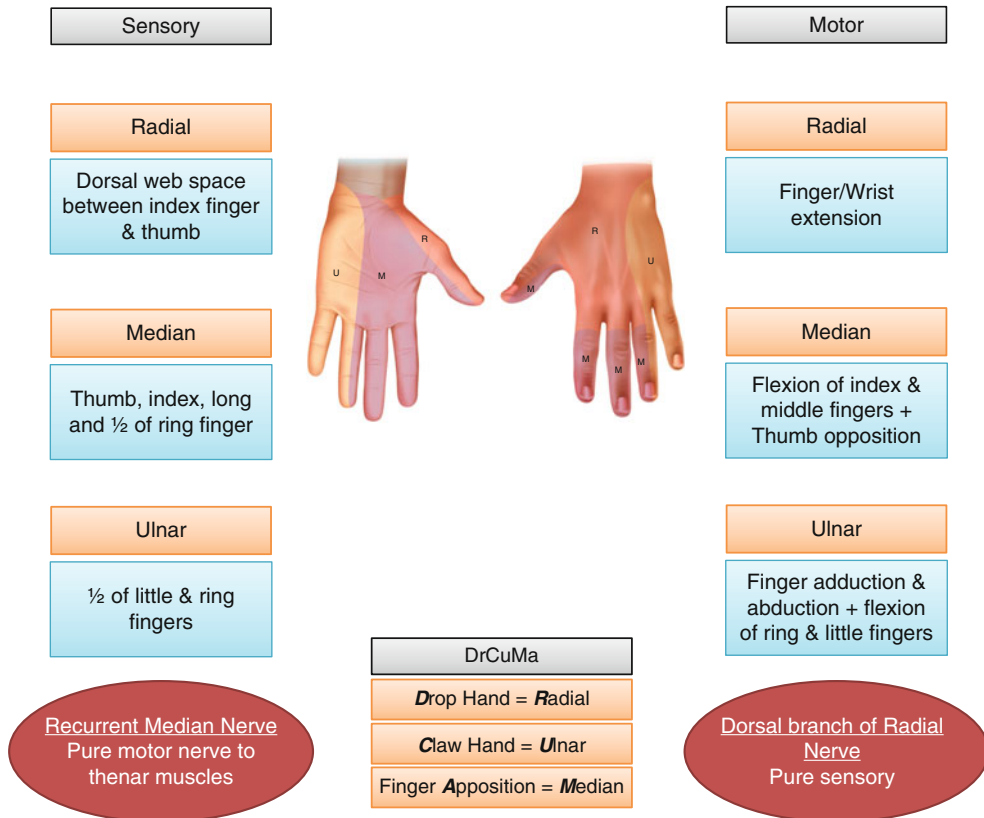
Center image (Reprinted from Abdelgawad A, Naga O. Introduction to orthopedic nomenclature. In: Abdelgawad A, Naga O, editors. Pediatric orthopedics: a handbook for primary care physicians. New York: Springer; 2014. p. 1–14. With permission from Springer Science + Business Media)

Salter-Harris Fractures

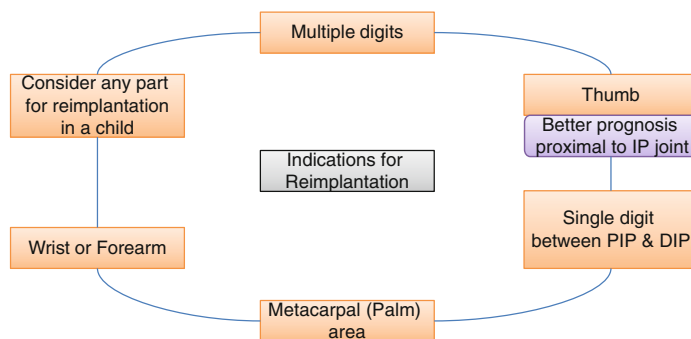


The Hand

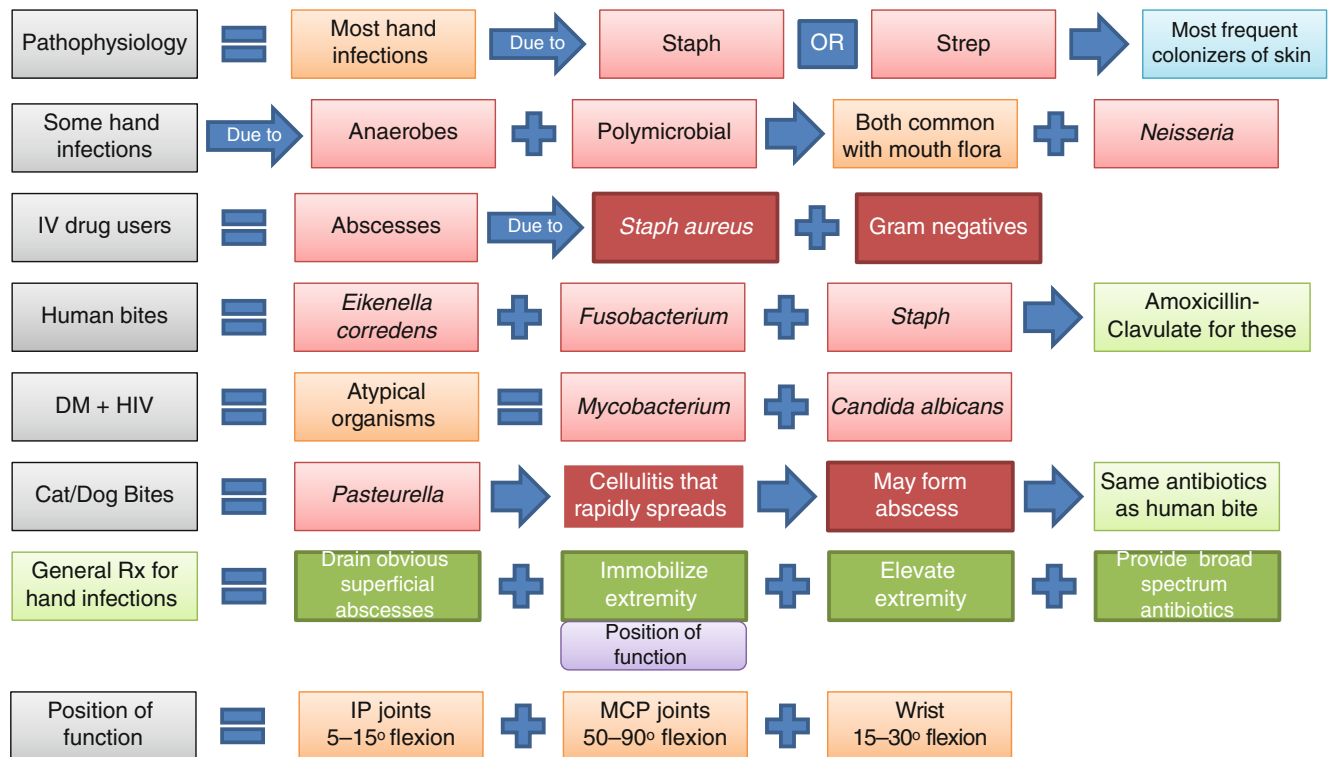
Nerves of the Hand



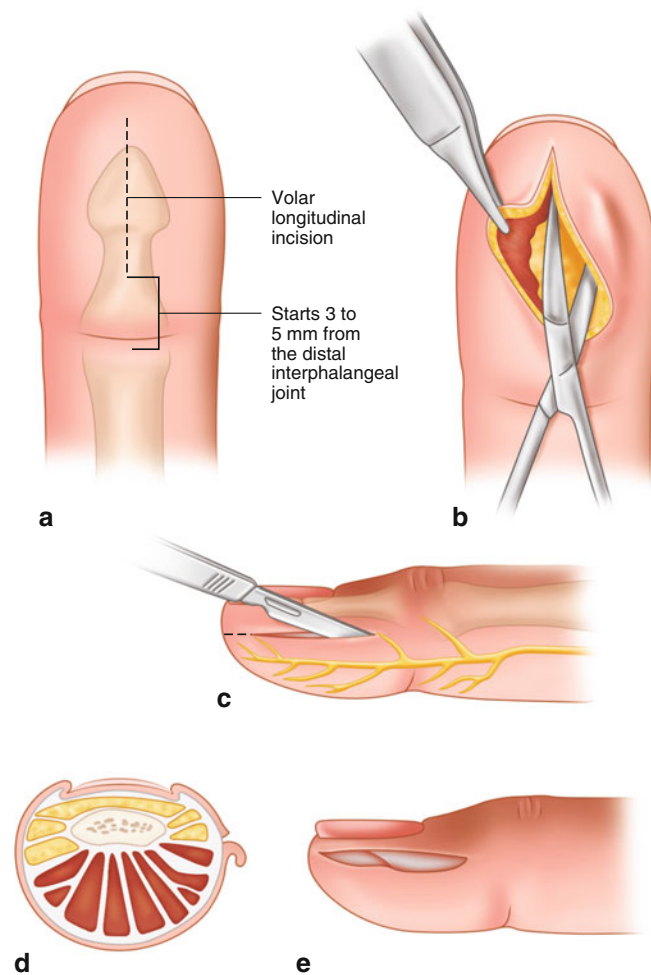
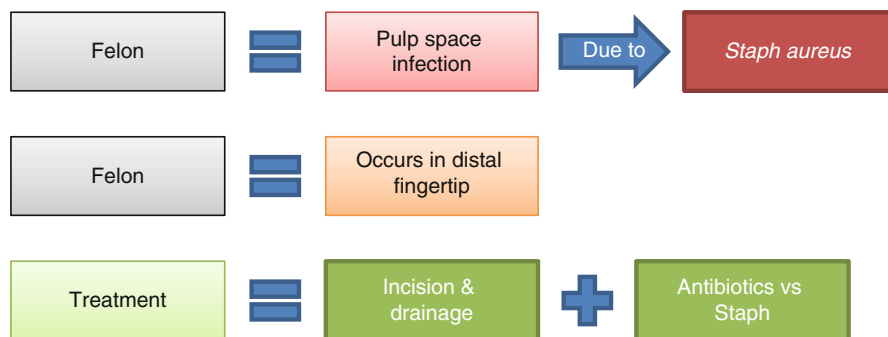
Amputation of the Digit (Look in Trauma)



Hand Infections

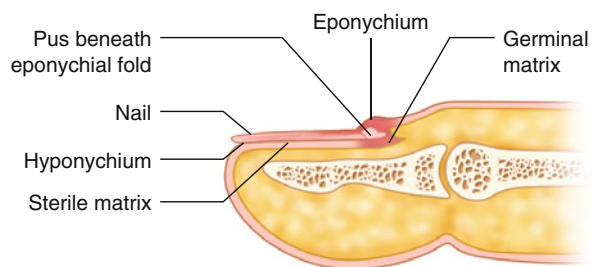
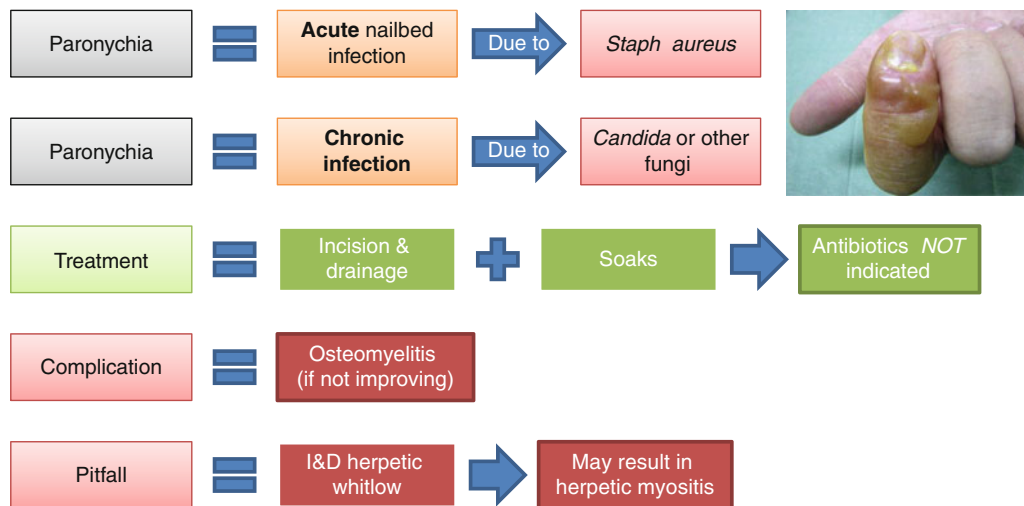


Felon



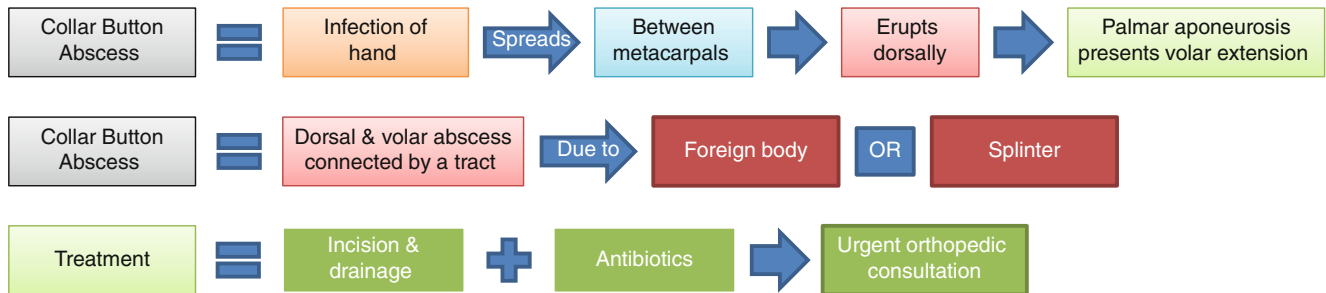
Top right image (Reprinted from Dailana ZH, Rigopoulos N. Infections of the hand. In: Bentley G, editor. European surgical orthopaedics and traumatology. Heidelberg: Springer Verlag; 2014. p. 2009–31. With permission from Springer Verlag)

Paronychia

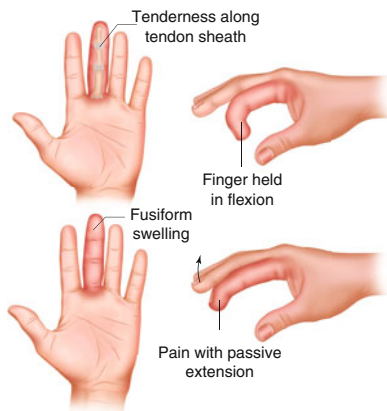
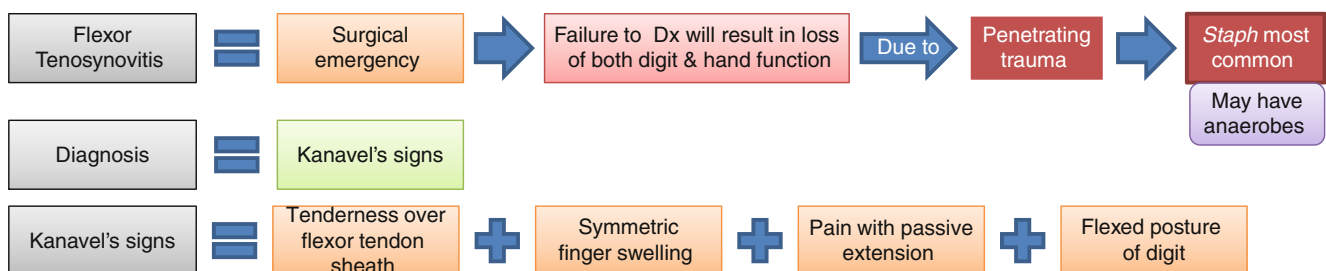


Top right image (Reprinted from Dailana ZH, Rigopoulos N. Infections of the hand. In: Bentley G, editor. European surgical orthopaedics and traumatology. Heidelberg: Springer Verlag; 2014. 2009–31. With permission from Springer Verlag)

Collar Button Abscess

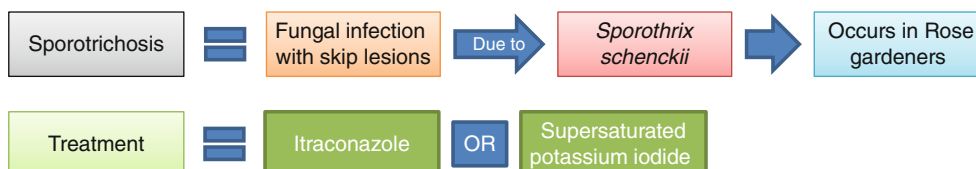


Flexor Tenosynovitis

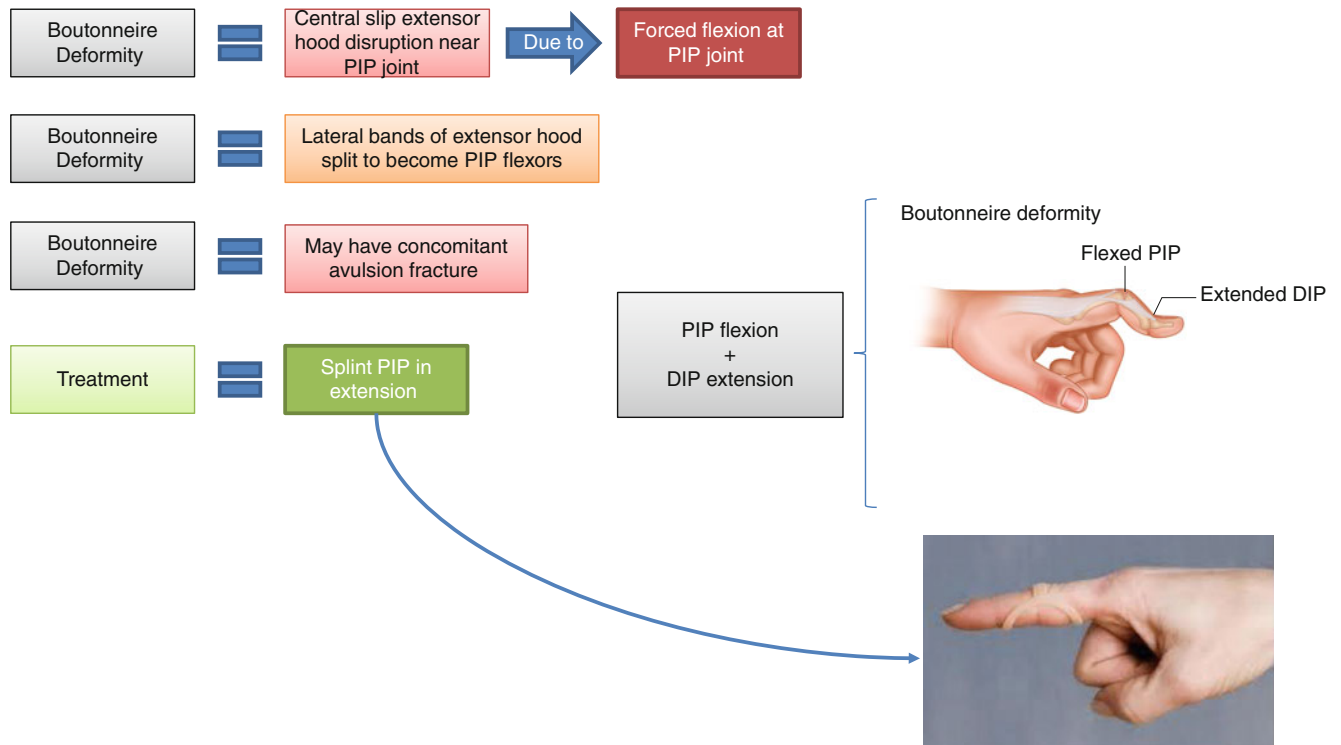


Bottom right image (Reprinted from Dailana ZH, Rigopoulos N. Infections of the hand. In: Bentley G, editor. European surgical orthopaedics and traumatology. Heidelberg: Springer Verlag; 2014. p. 2009–31. With permission from Springer Verlag)

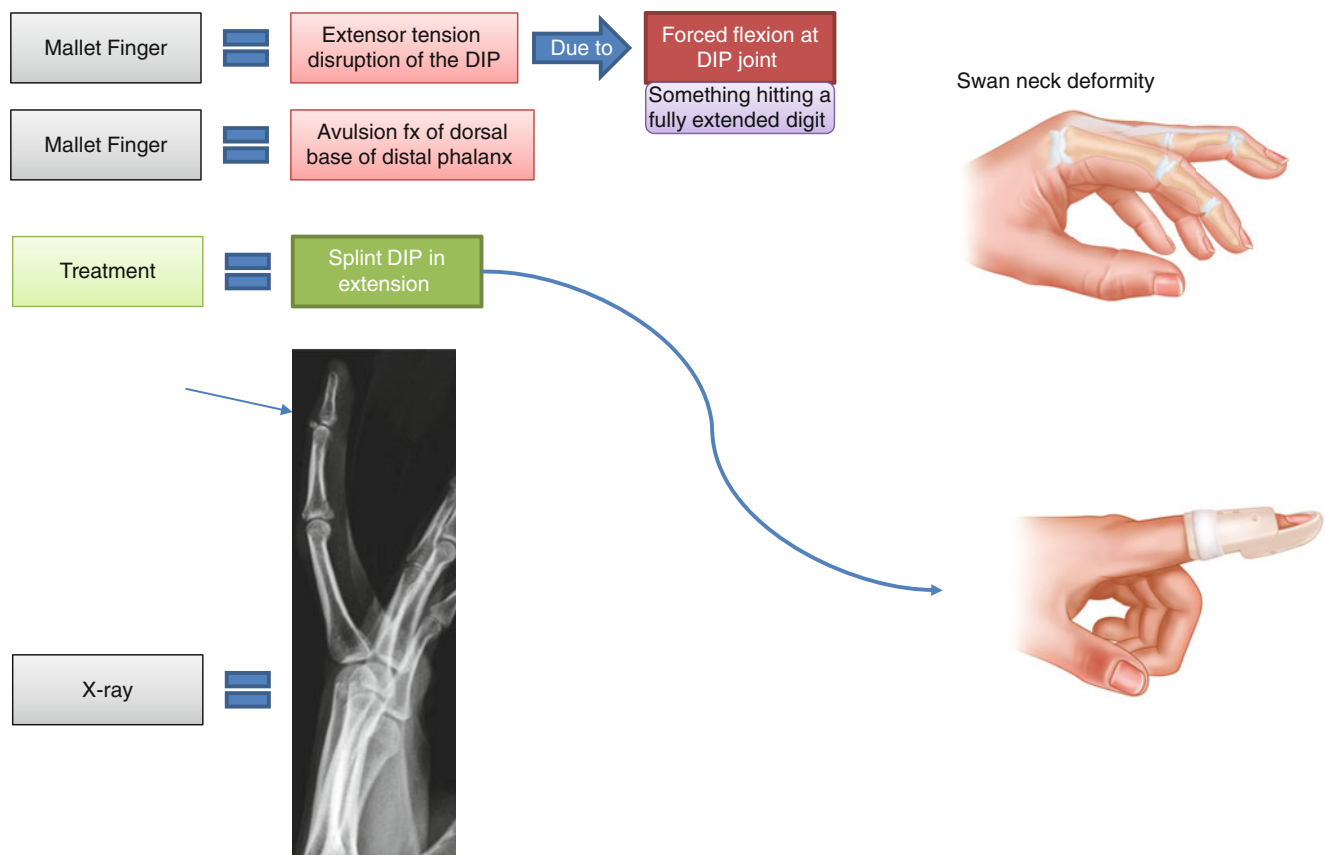
Sporotrichosis



Boutonniere Deformity

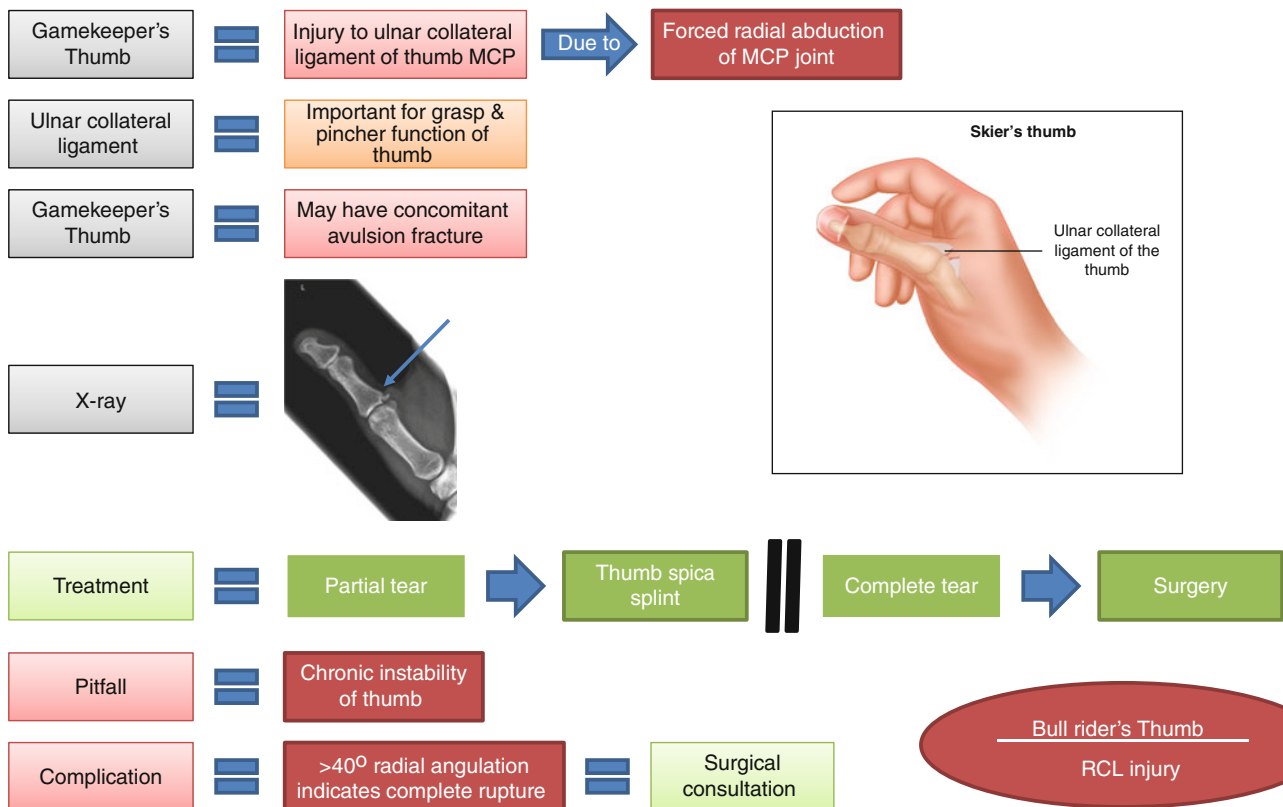


Mallet Finger



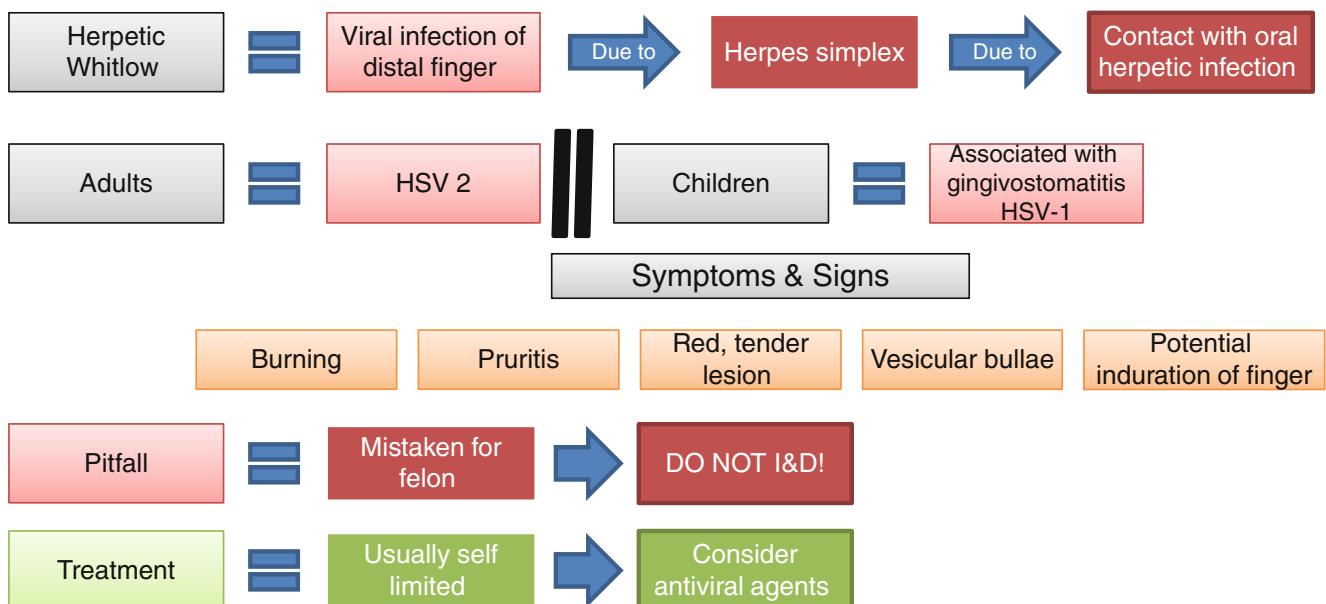
Bottom left image (Reprinted from Almusa E, Peterson II WM, Bianchi S, Jacob D, Hoffman D. Radiological investigations. In: Chick G, editor. Acute and chronic finger injuries in ball sports. Paris: Springer Verlag; 2013. p. 89–124. With permission from Springer Verlag)

Gamekeeper's (Skier's) Thumb

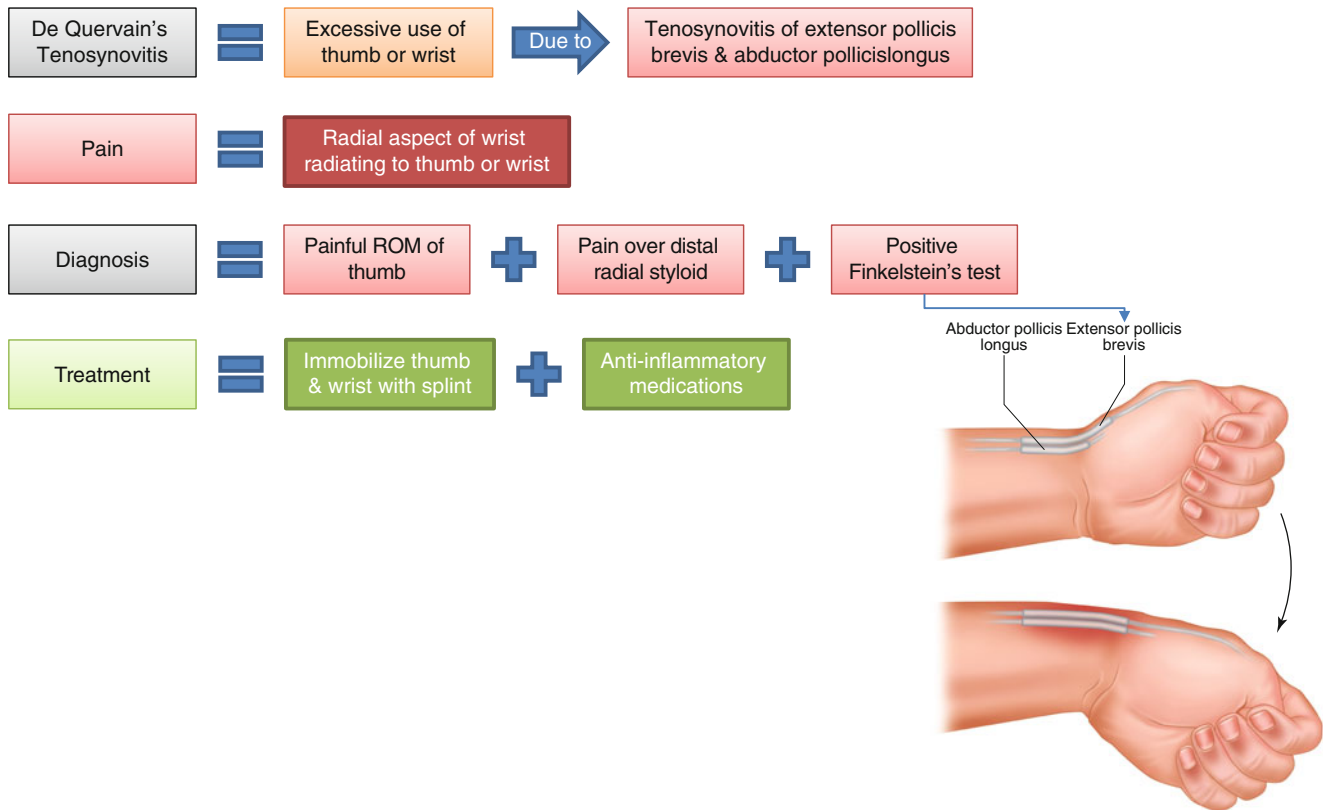


Center left image (Reprinted from Almusa E, Peterson II WM, Bianchi S, Jacob D, Hoffman D. Radiological investigations. In: Chick G, editor. Acute and chronic finger injuries in ball sports. Paris: Springer Verlag; 2013. p. 89–124. With permission from Springer Verlag)

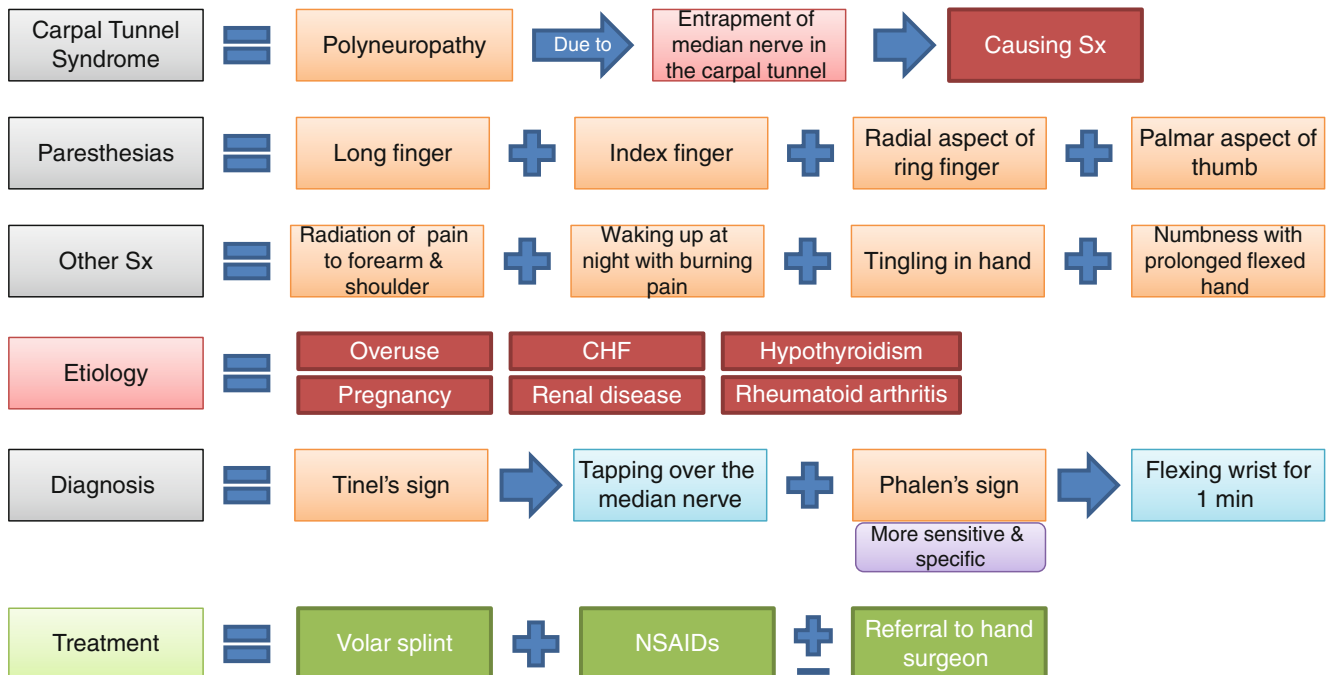
Herpetic Whitlow



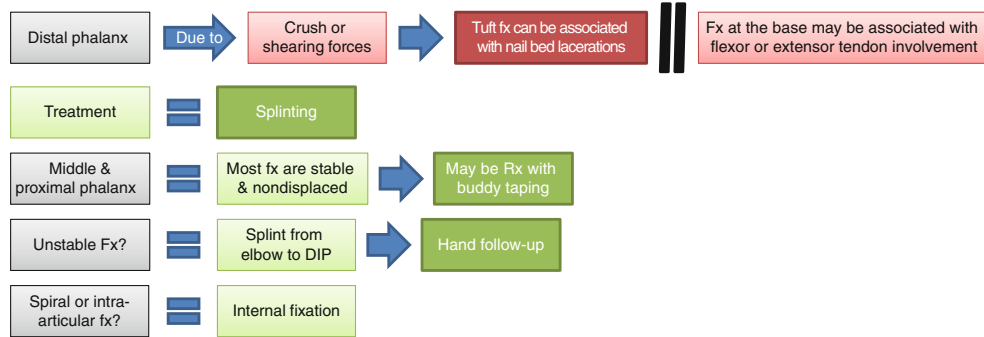
De Quervain's Tenosynovitis



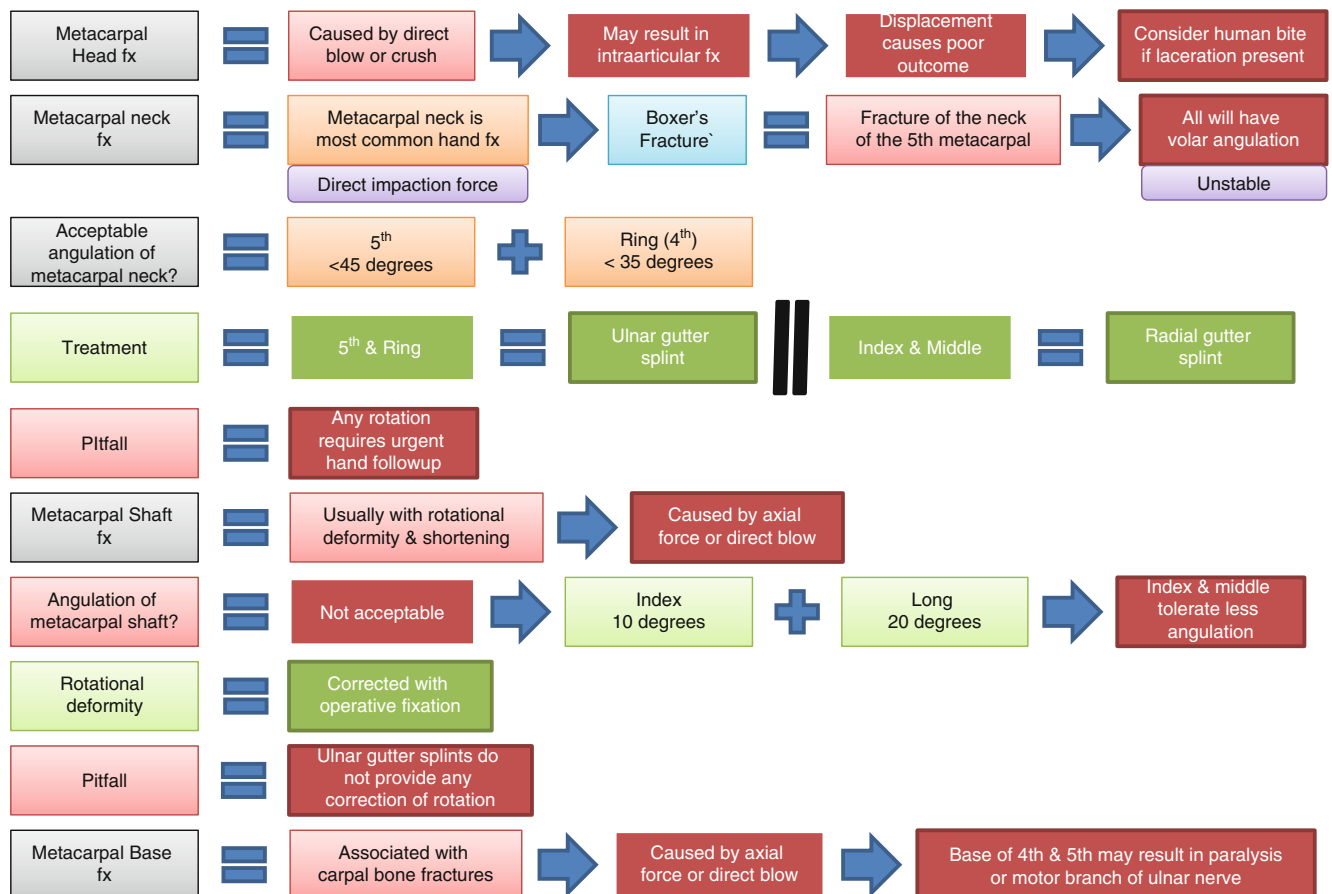
Carpal Tunnel Syndrome



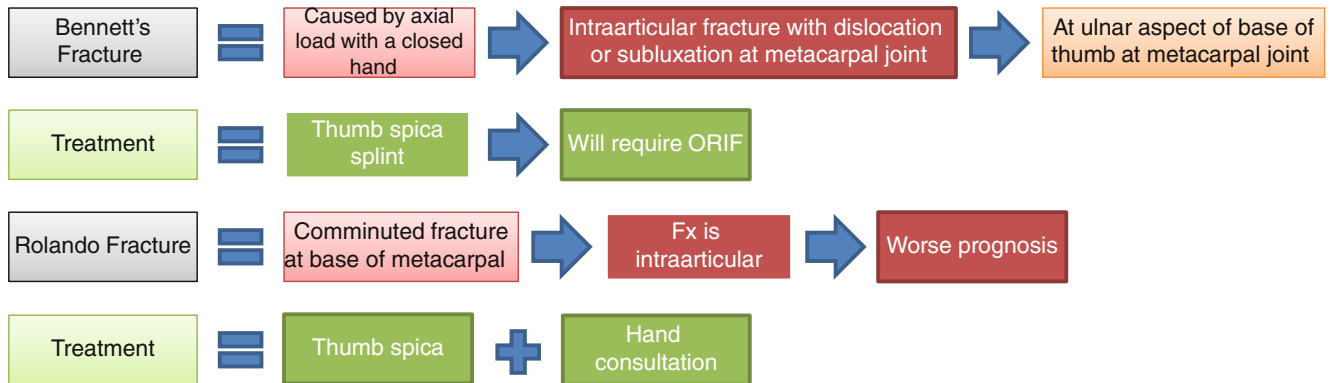
Fractures of the Hand: Phalanx



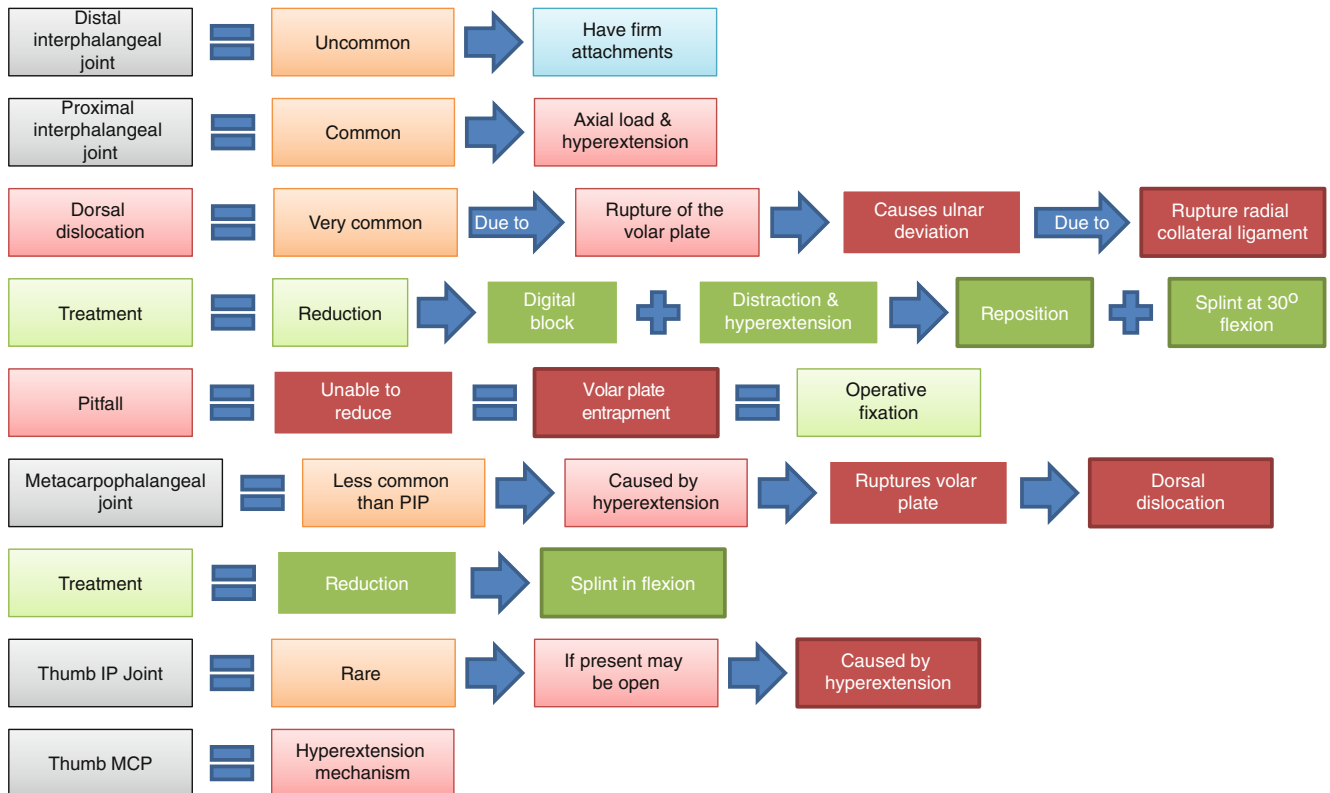
Fractures of the Hand: Metacarpals



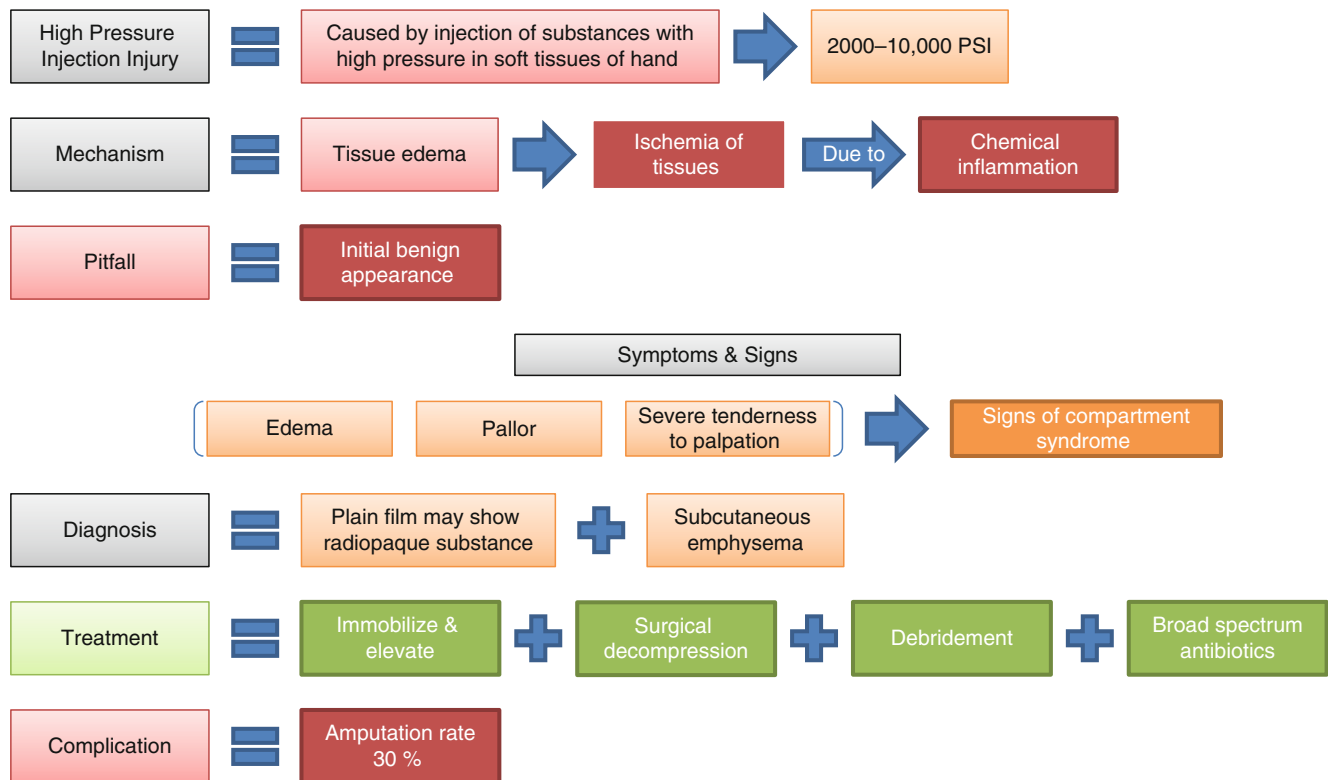
Special Fractures of the Metacarpals



Finger Dislocation

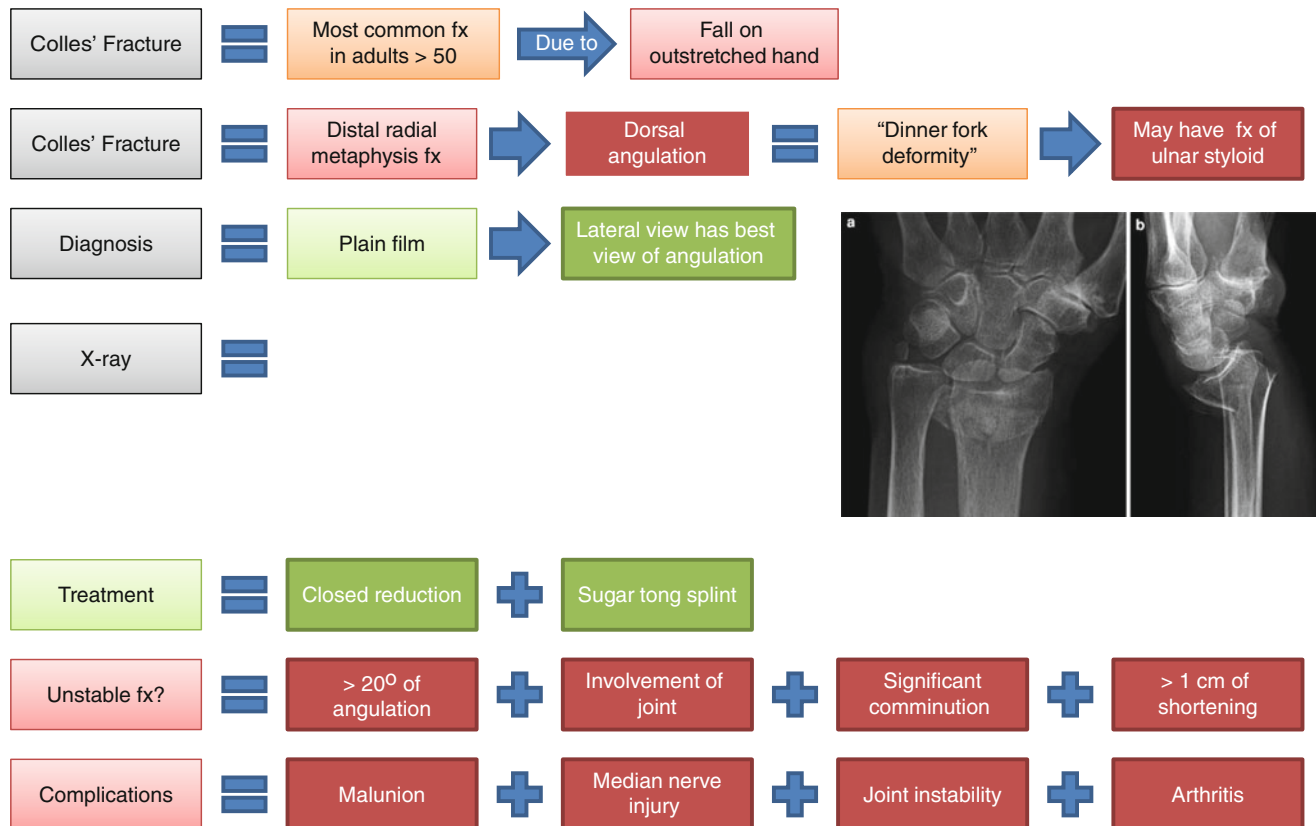


High-Pressure Injection Injury

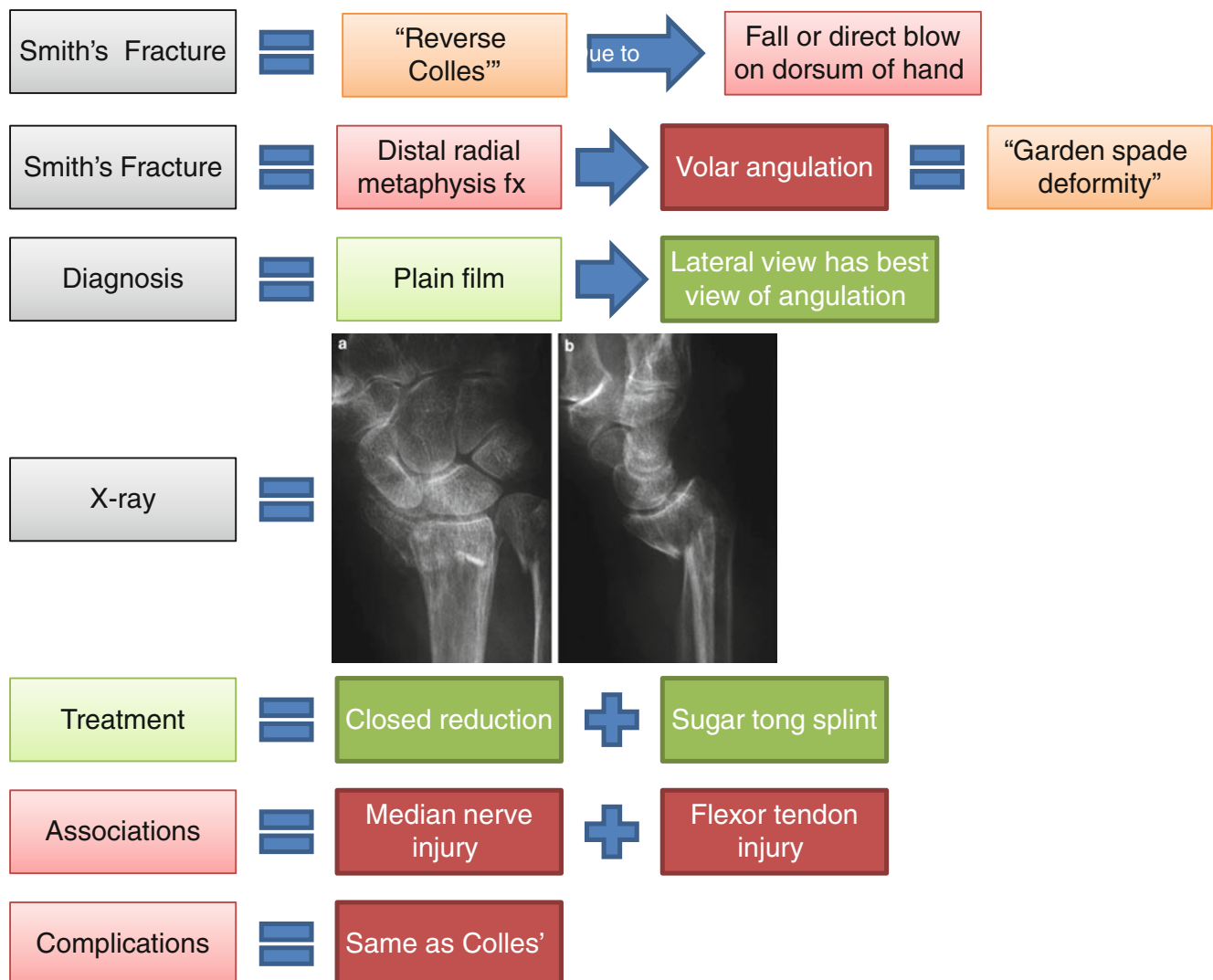


Fractures and Dislocations of the Wrist

Colles' Fracture

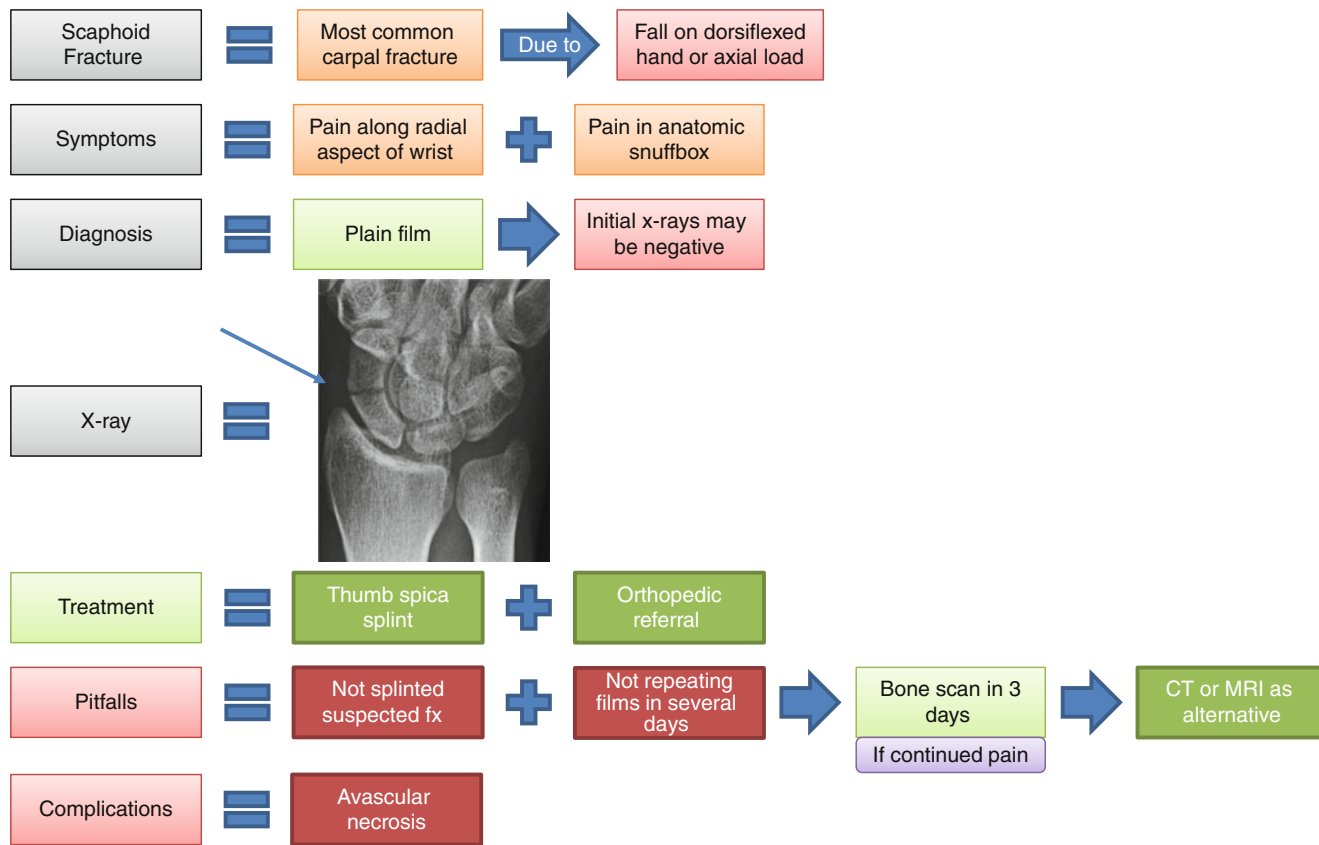


Center right image (Reprinted from Raby N. Imaging of wrist trauma. In: Davies AM, Grainger AJ, James SJ, editors. Imaging of the hand and wrist. Heidelberg: Springer Verlag; 2013. p. 141–69. With permission from Springer Verlag)

Smith's Fracture

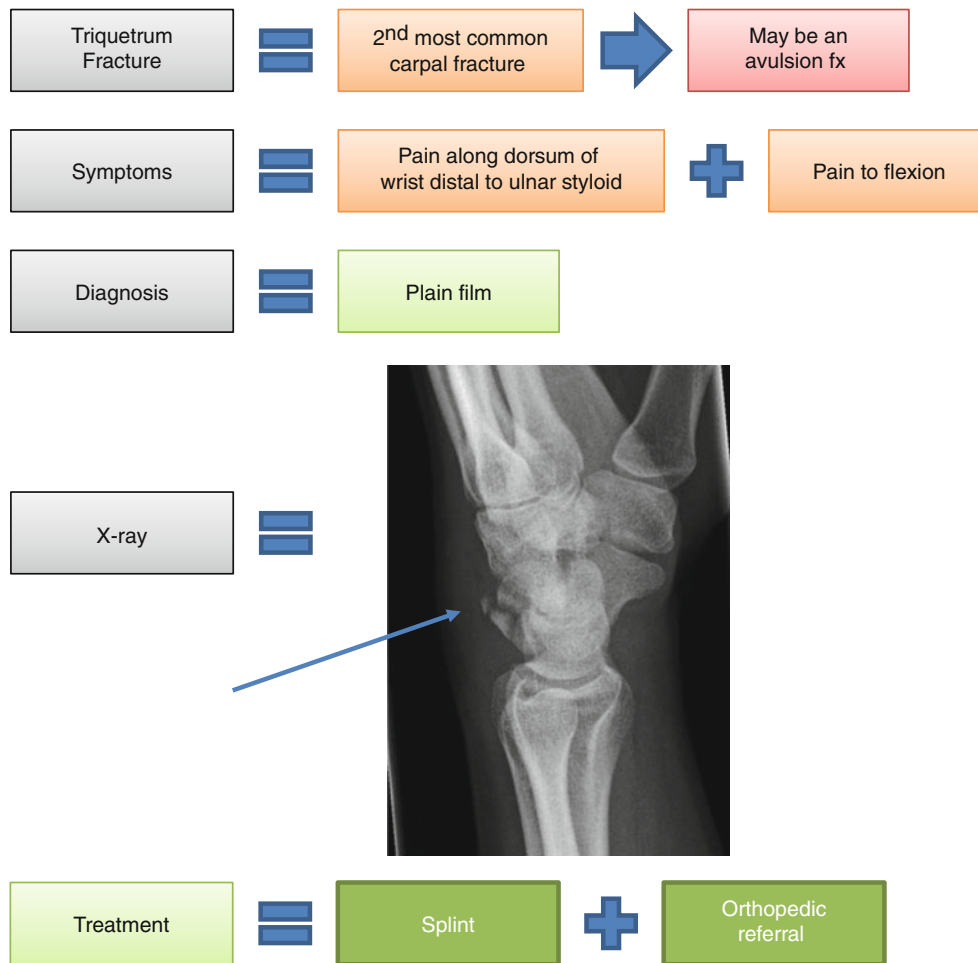
Center image (Reprinted from Raby N. Imaging of wrist trauma. In: Davies AM, Grainger AJ, James SJ, editors. Imaging of the hand and wrist. Heidelberg: Springer Verlag; 2013. p. 141–69. With permission from Springer Verlag)

Scaphoid Fracture



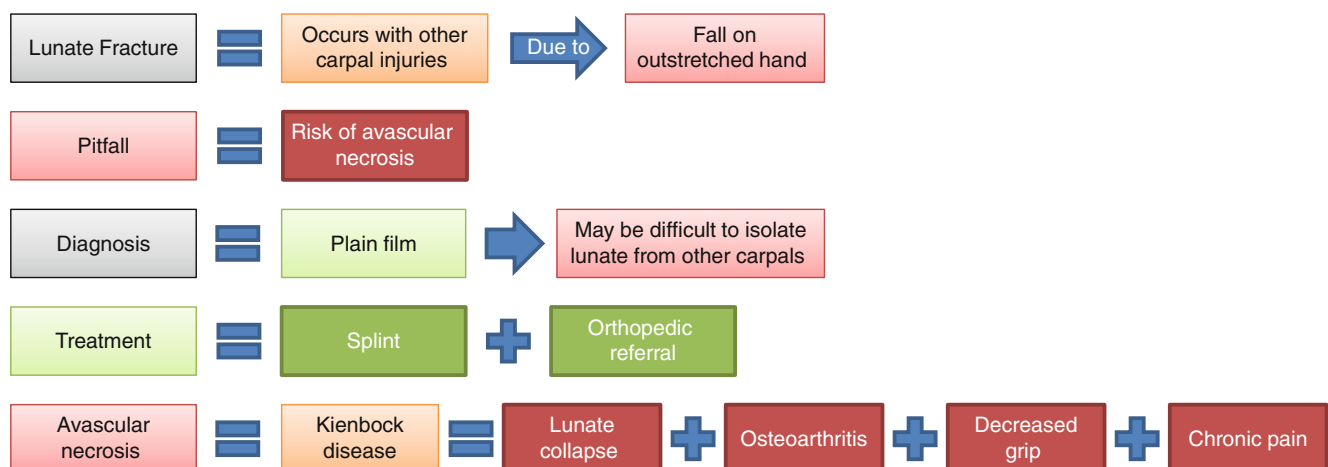
Center image (Reprinted from Raby N. Imaging of wrist trauma. In: Davies AM, Grainger AJ, James SJ, editors. Imaging of the hand and wrist. Heidelberg: Springer Verlag; 2013. p. 141–69. With permission from Springer Verlag)

Triquetral Fracture

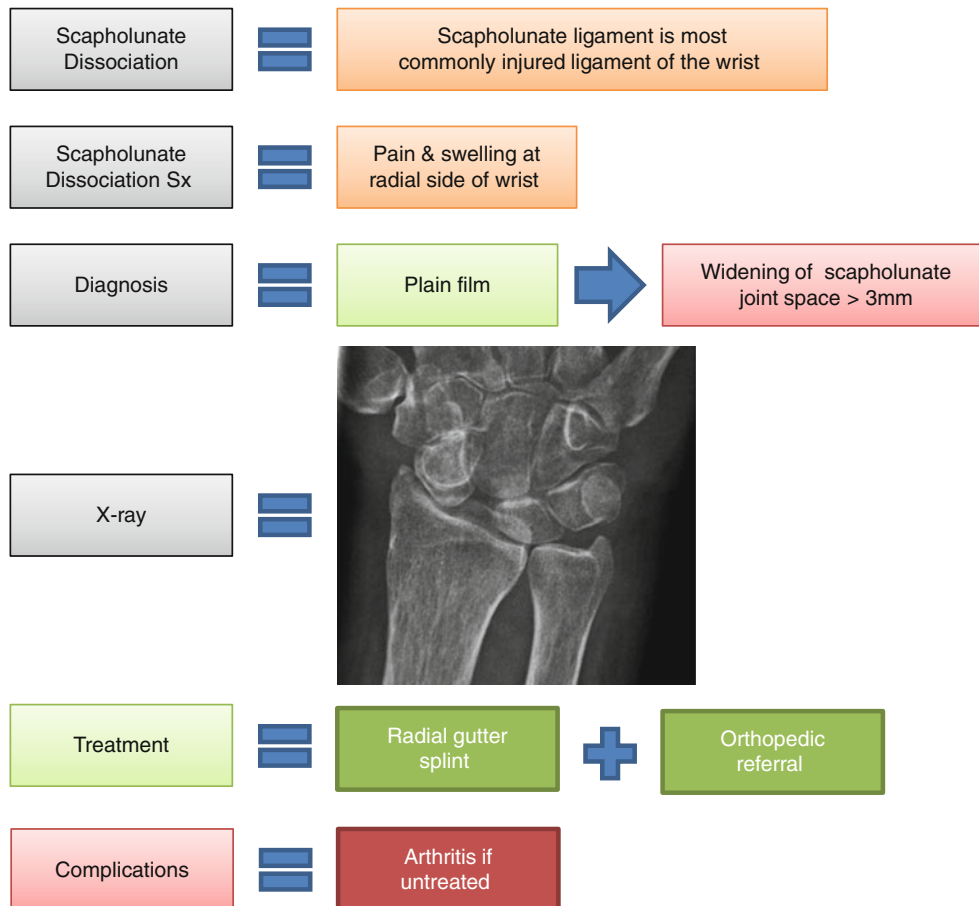


Center bottom image (Reprinted from Raby N. Imaging of wrist trauma. In: Davies AM, Grainger AJ, James SJ, editors. Imaging of the hand and wrist. Heidelberg: Springer Verlag; 2013. p. 141–69. With permission from Springer Verlag)

Other Hand Fracture Tidbits

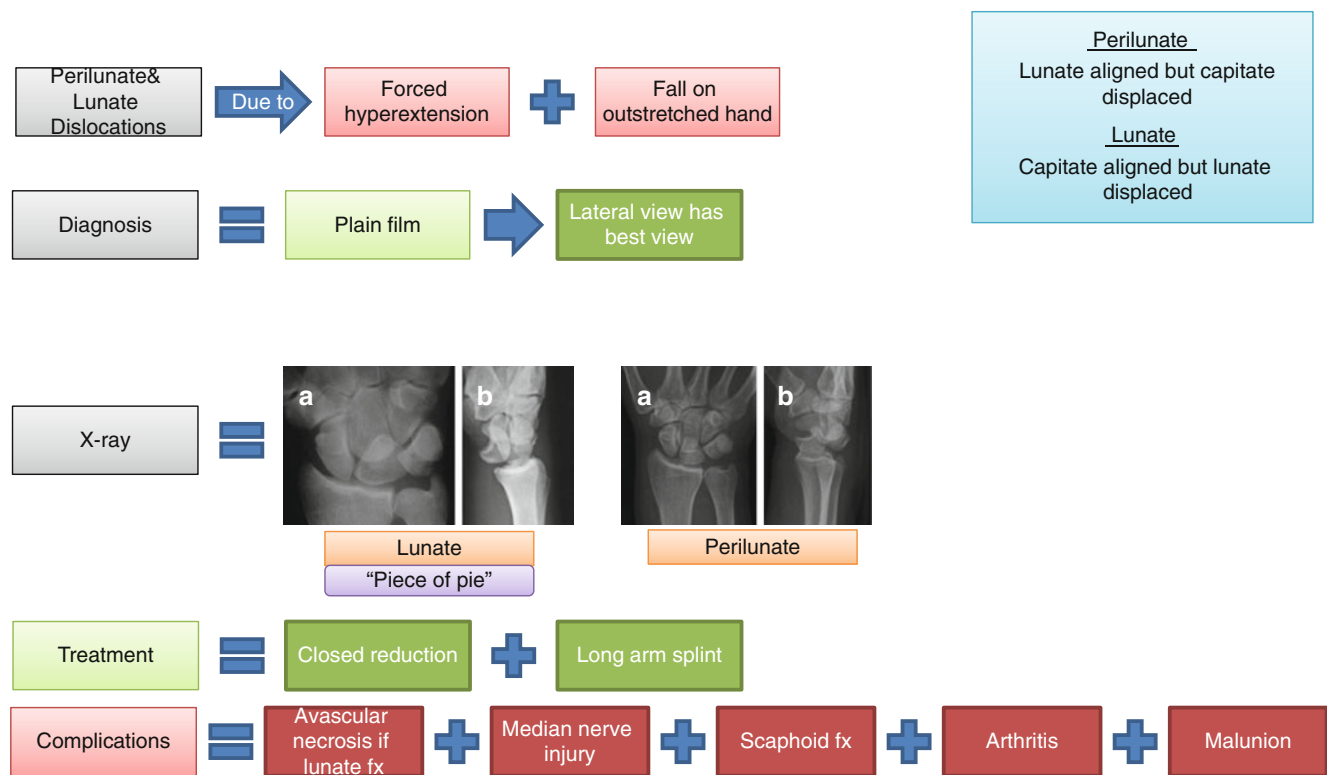


Scapholunate Dissociation



Center image (Reprinted from Raby N. Imaging of wrist trauma davies. In: Davies AM, Grainger AJ, James SJ, editors. Imaging of the hand and wrist. Heidelberg: Springer Verlag; 2013. p. 141–69. With permission from Springer Verlag)

Perilunate and Lunate Dislocations

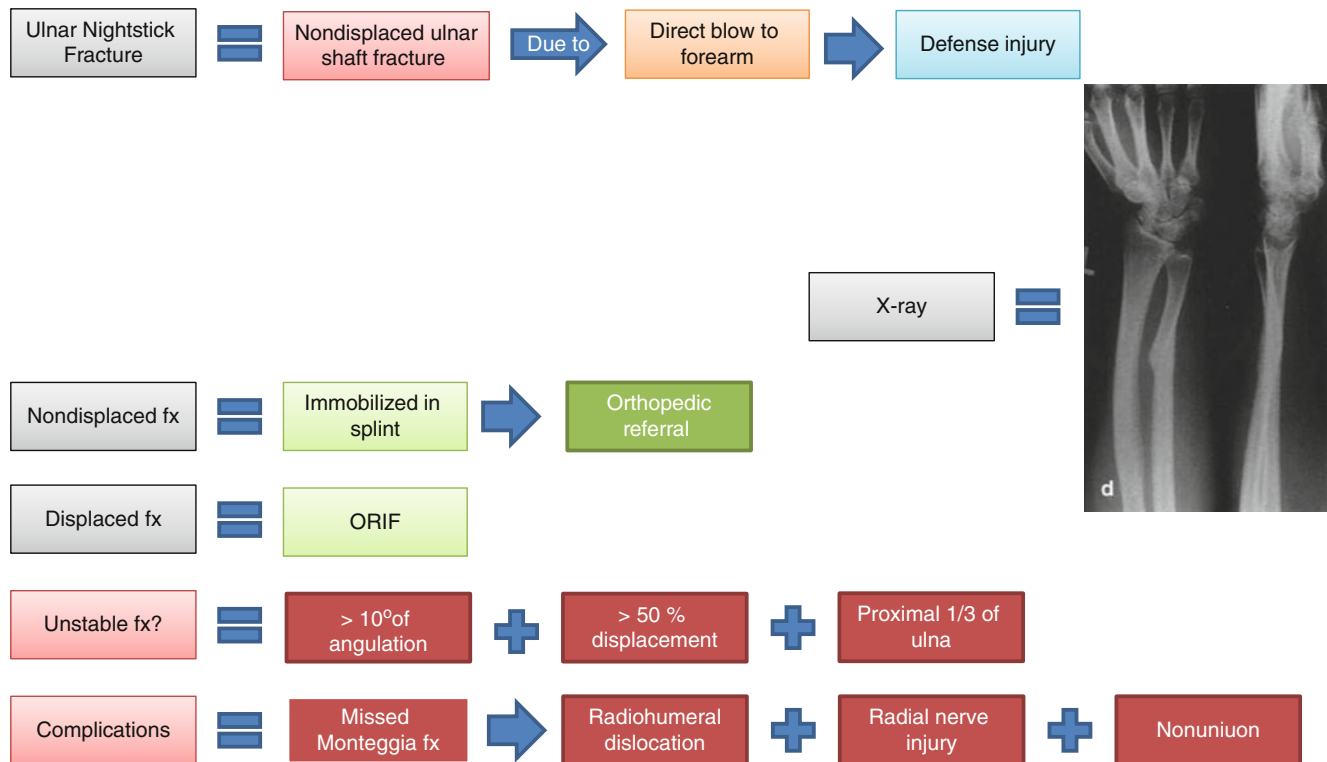


Center left image (Reprinted from Raby N. Imaging of wrist trauma davies. In: Davies AM, Grainger AJ, James SJ, editors. Imaging of the hand and wrist. Heidelberg: Springer Verlag; 2013. p. 141–69. With permission from Springer Verlag)

Center right image (Reprinted from Raby N. Imaging of wrist trauma davies. In: Davies AM, Grainger AJ, James SJ, editors. Imaging of the hand and wrist. Heidelberg: Springer Verlag; 2013. p. 141–69. With permission from Springer Verlag)

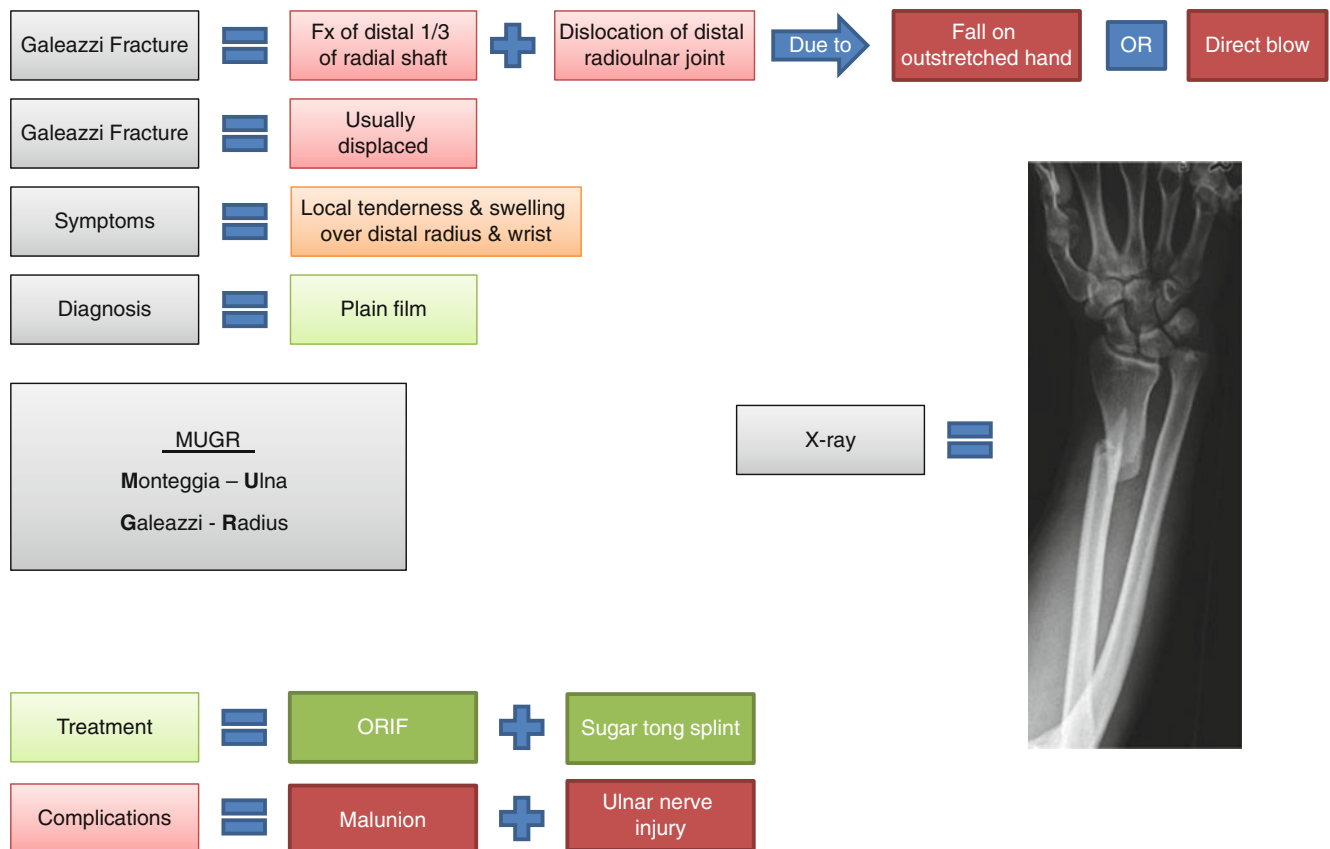
The Forearm

Ulnar Nightstick Fracture



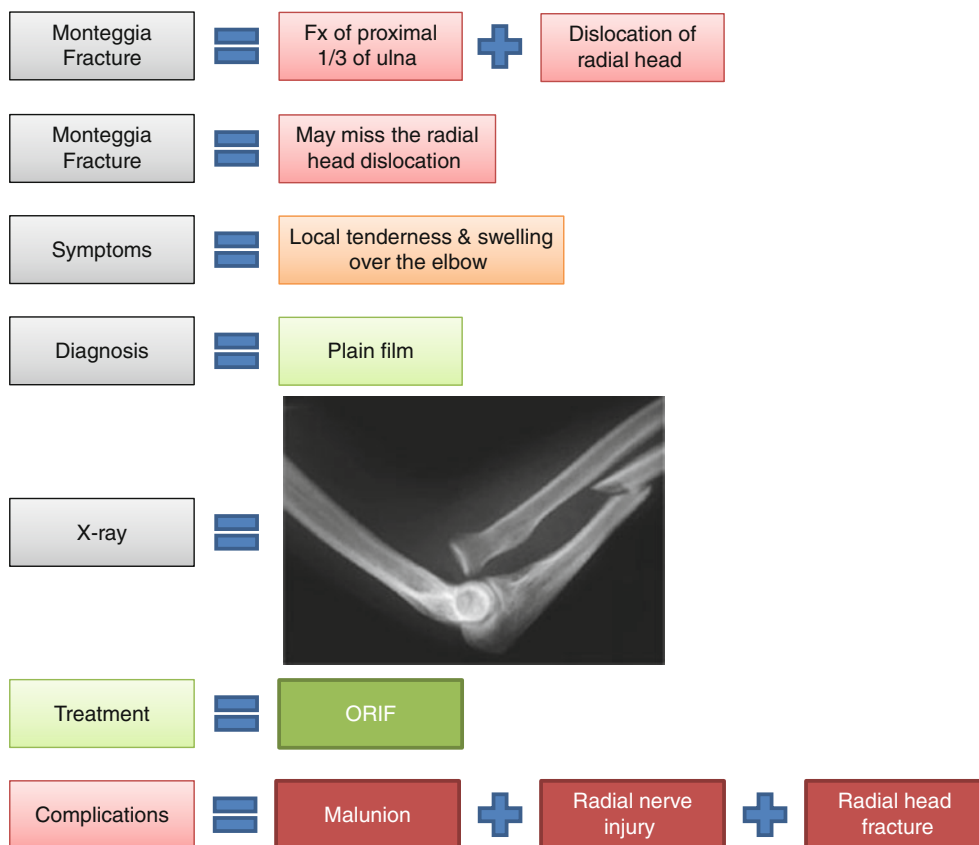
Center right image (Reprinted from De Boeck H, Haentjens P, Handelberg F, Casteleyn PP, Opdecam P. Treatment of isolated distal ulnar shaft fractures with below-elbow plaster cast. Arch Orthop Trauma Surg. 1996;115(6):316–20. With permission from Springer Verlag)

Galeazzi Fracture



Lower right image (Reprinted from Haugstvedt JR. Galeazzi's fracture and Essex-Lopresti injuries: dislocation fractures of the forearm. In: Hove LM, Lindau T, Hølmer P, editors. Distal radius fractures: current concepts. Heidelberg: Springer Verlag; 2014. p. 391–401. With permission from Springer Verlag)

Monteggia Fracture



Bottom center image (Reprinted from Casado-Sanz E, Barco R, Antuña SA. Complex fractures of the proximal humerus. In: Rodríguez-Merchán EC, Rubio-Suárez JC, editors. Complex fractures

of the limbs. Zug: Springer International Publishing; 2014. p. 1–8. With permission from Springer International Publishing)

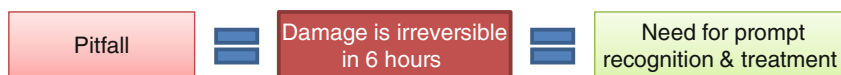
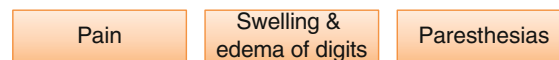
Both Ulna and Radius Fractures



Volkmann's Ischemic Contracture



Symptoms & Signs



The Elbow

Soft Tissue Injuries



Symptoms & Signs

Snap or pop is heard & felt

Pain in anterior shoulder

Swelling, tenderness, & crepitus over bicipital groove

Flexion of elbow causes pain and produces a midarm "ball"

Treatment

Sling, ice, analgesics

Referral to orthopedic surgeon

Triceps Rupture

=

Distal injury

→ Due to

Fall on outstretched hand

OR

Direct blow to olecranon

OR

Spontaneous

Hyperparathyroidism

Symptoms & Signs

Pain in posterior elbow

Complete ruptures cause inability to extend the elbow

Partial tears may have some function

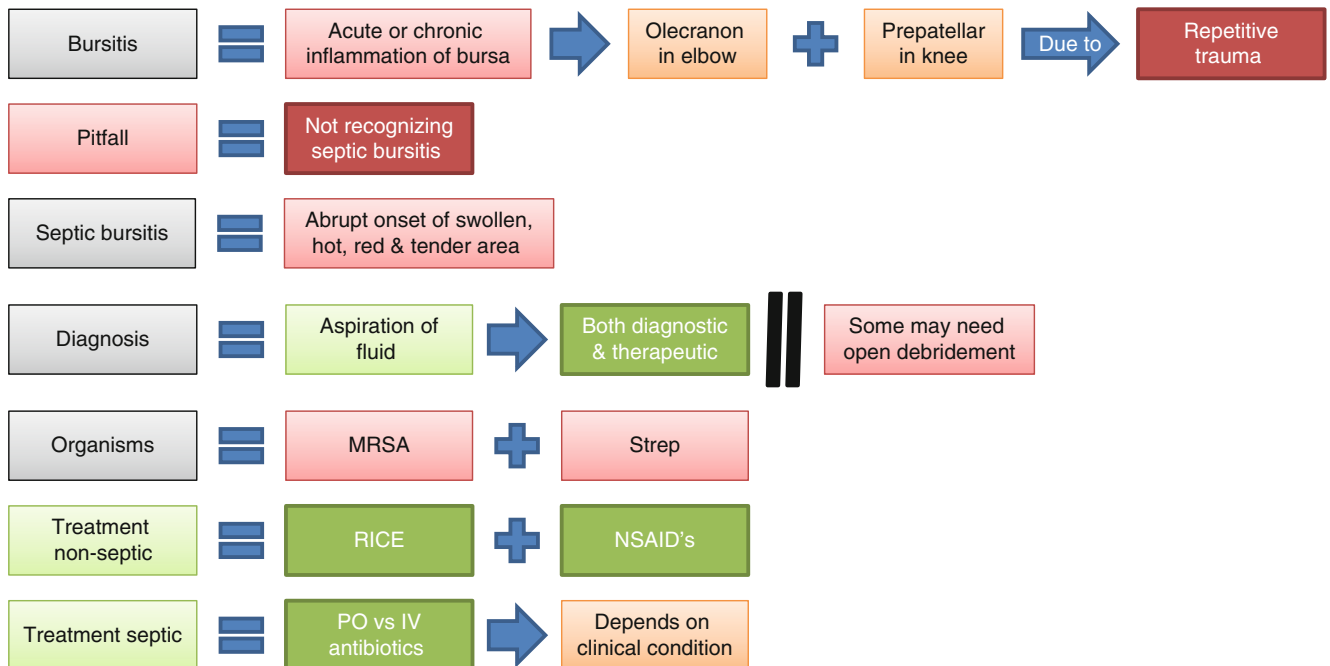
Swelling & tenderness posteriorly proximal to olecranon

Treatment

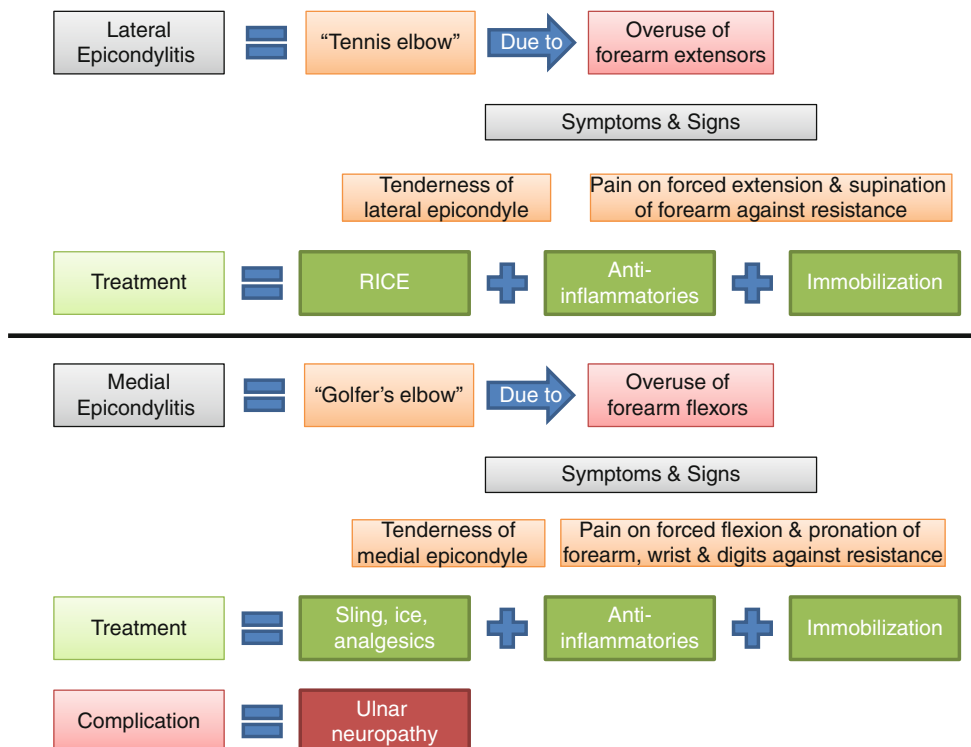
Sling, ice, analgesics

Referral to orthopedic surgeon

Bursitis



Epicondylitis



Nursemaid's Elbow

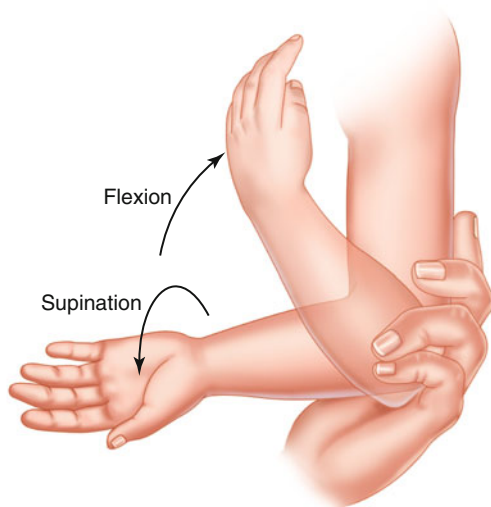
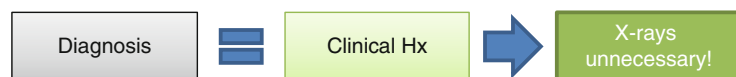
PEDIATRICS



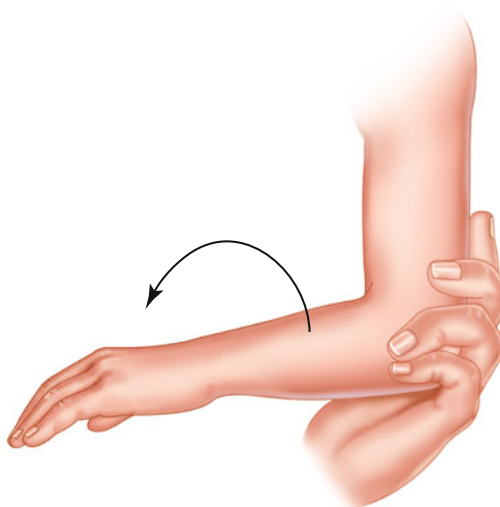
Symptoms & Signs

Child reluctant to move arm

Forearm flexed and pronated

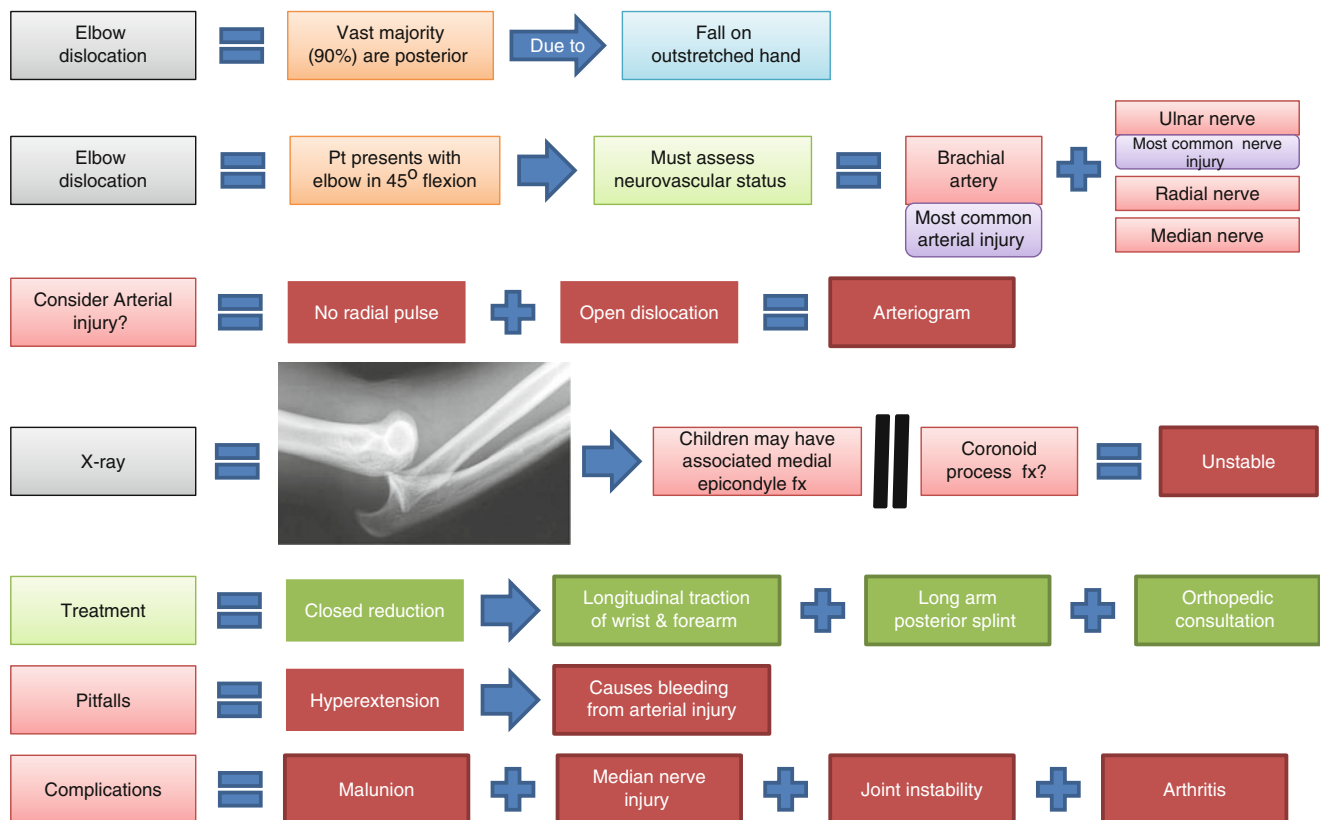


Supination-flexion



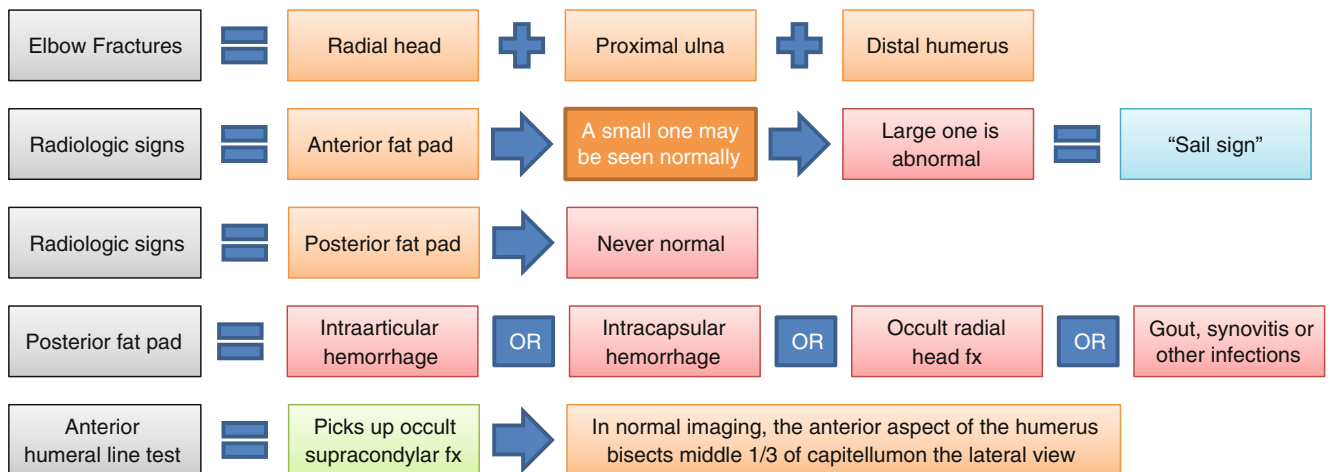
Hyperpronation

Elbow Dislocation

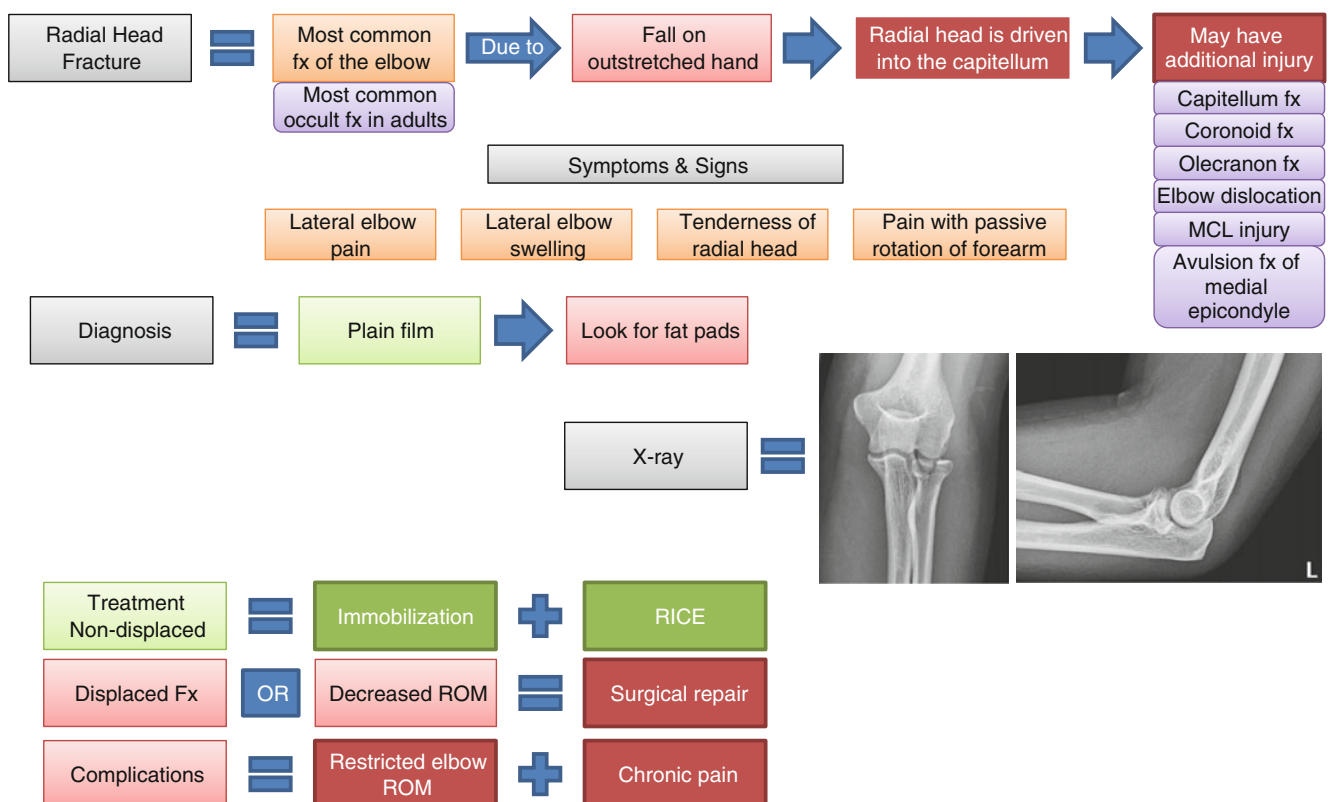


Left center image (Reprinted from Spina V, Baldini L. Imaging of the elbow. In: Celli A, Celli L, Morrey BF, editors. Treatment of elbow lesions: new aspects in diagnosis & surgical techniques. Milan: Springer Verlag; 2008. p. 21–38. With permission from Springer Verlag)

Elbow Fracture Tidbits



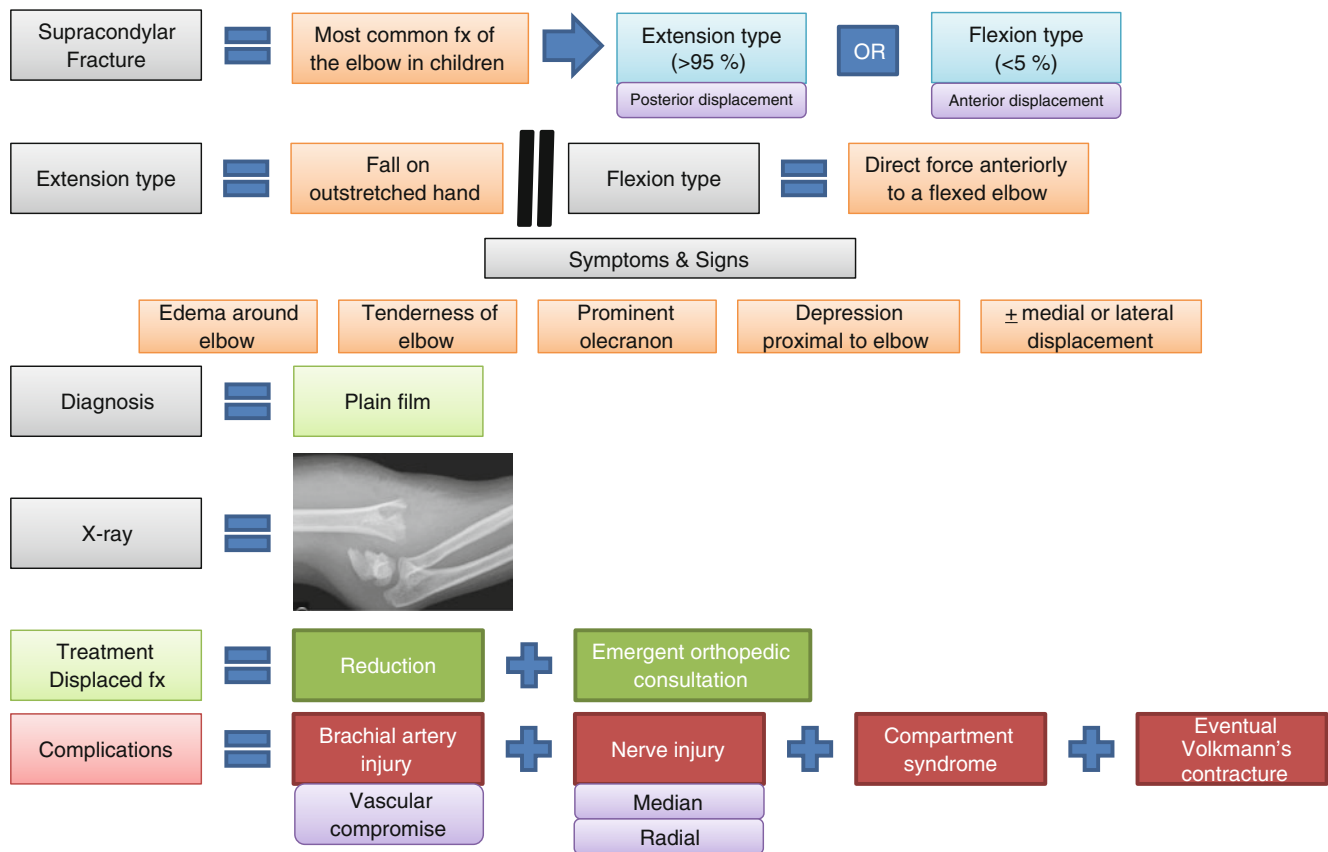
Radial Head Fracture



Right center image (Reprinted from Daneshvar P, Pollock JW, Athwal GS. Fractures and dislocations of the proximal ulna and radial head. In: Antuña S, Barco R, editors. Essentials in elbow surgery. London: Springer Verlag; 2014. p. 61–89. With permission from Springer Verlag)

Right image (Reprinted from Daneshvar P, Pollock JW, Athwal GS. Fractures and dislocations of the proximal ulna and radial head. In: Antuña S, Barco R, editors. Essentials in elbow surgery. London: Springer Verlag; 2014. p. 61–89. With permission from Springer Verlag)

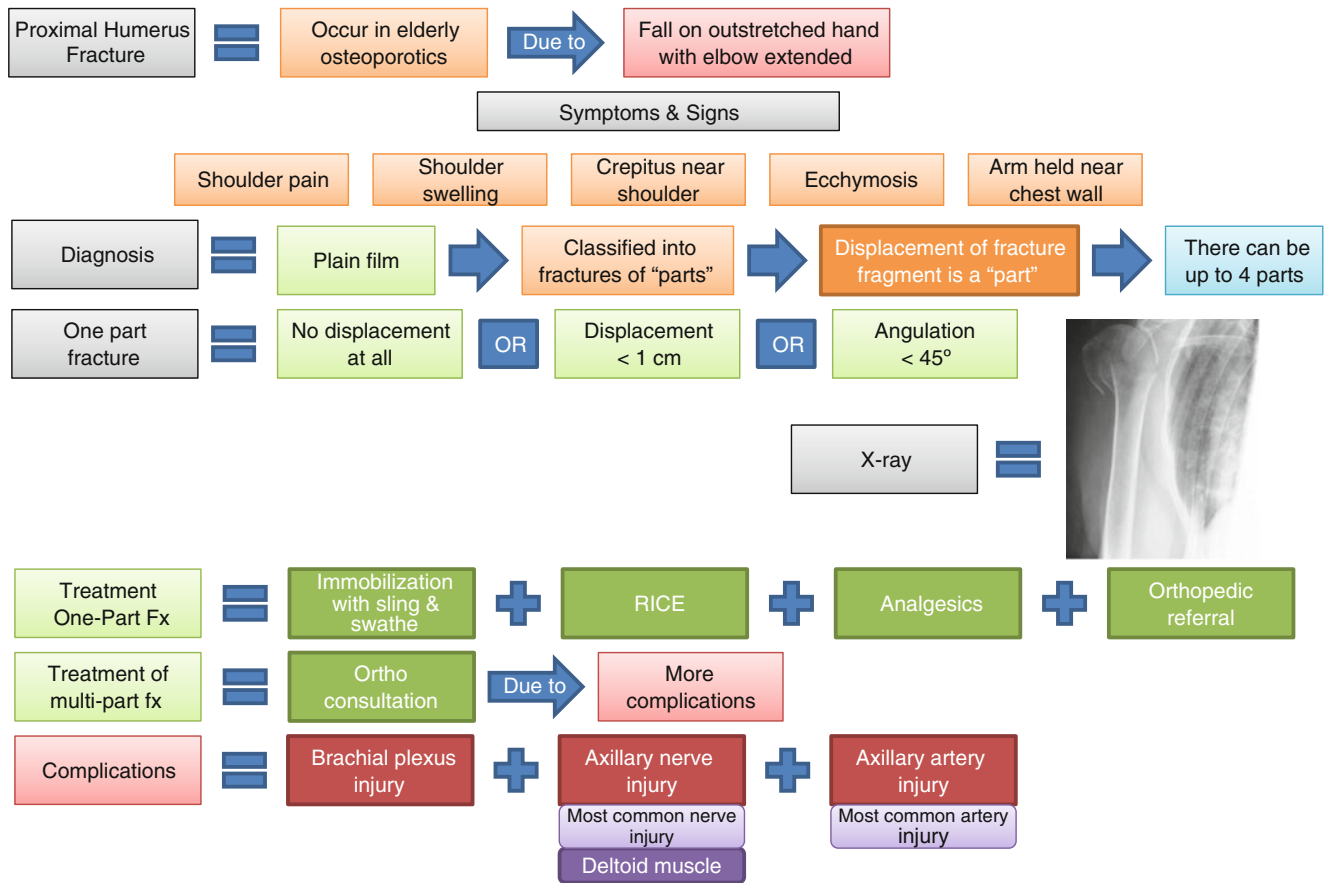
Supracondylar Fracture



Left center image (Reprinted from Abdelgawad A, Enes Kanlic. Orthopedic trauma. In: Abdelgawad A, Naga O, editors. Pediatric orthopedics: a handbook for primary care physicians. New York: Springer; 2014. p. 409–83. With permission from Springer Science + Business Media)

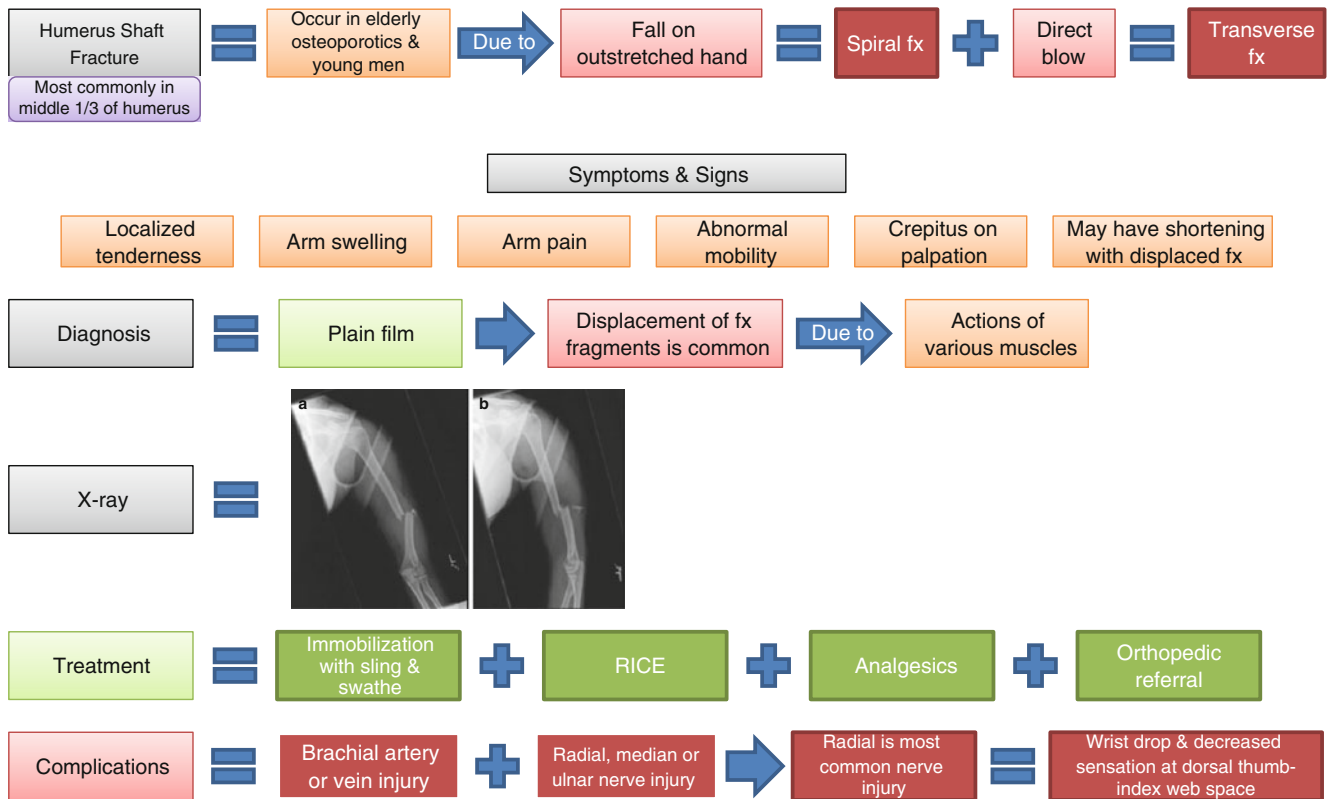
The Humerus and Shoulder

Proximal Humerus Fracture



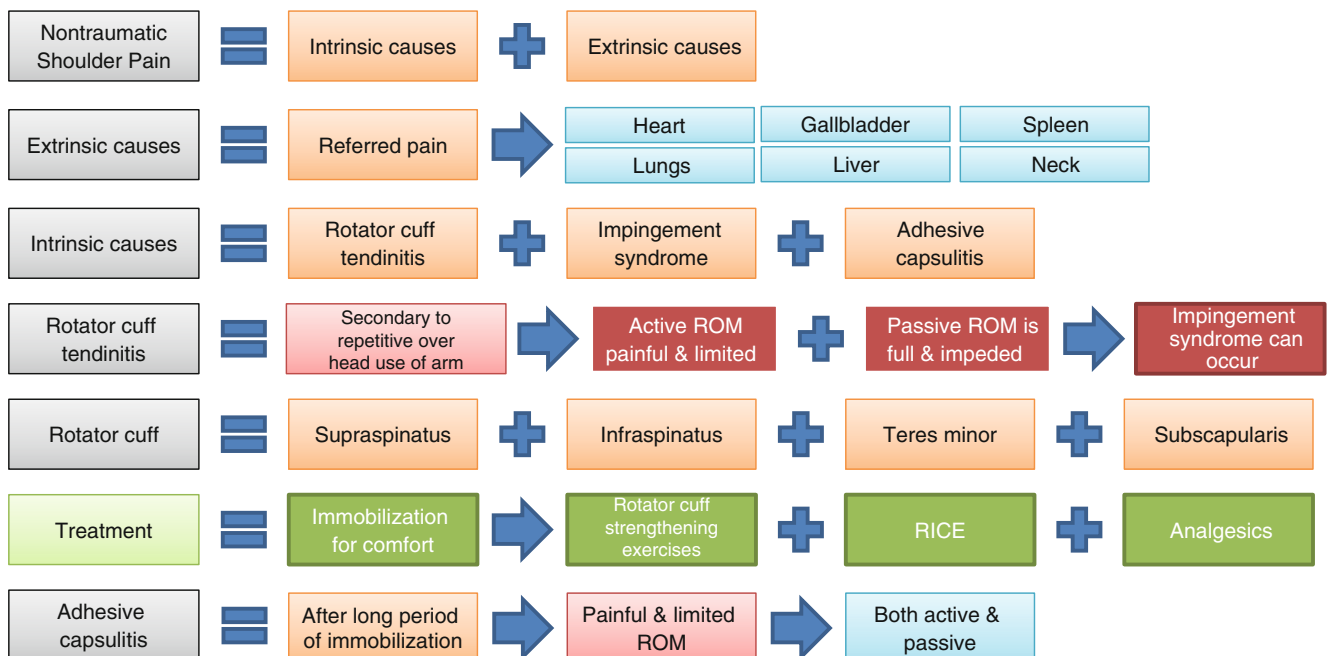
Right center image (Reprinted from Erhardt JB, Roderer G, Grob K, Forster TN, Stoffel K, Kuster MS. Early results in the treatment of proximal humeral fractures with a polyaxial locking plate. Arch Orthop Trauma Surg. 2009;129(10):1367–74. With permission from Springer Science + Business Media)

Humerus Shaft Fracture

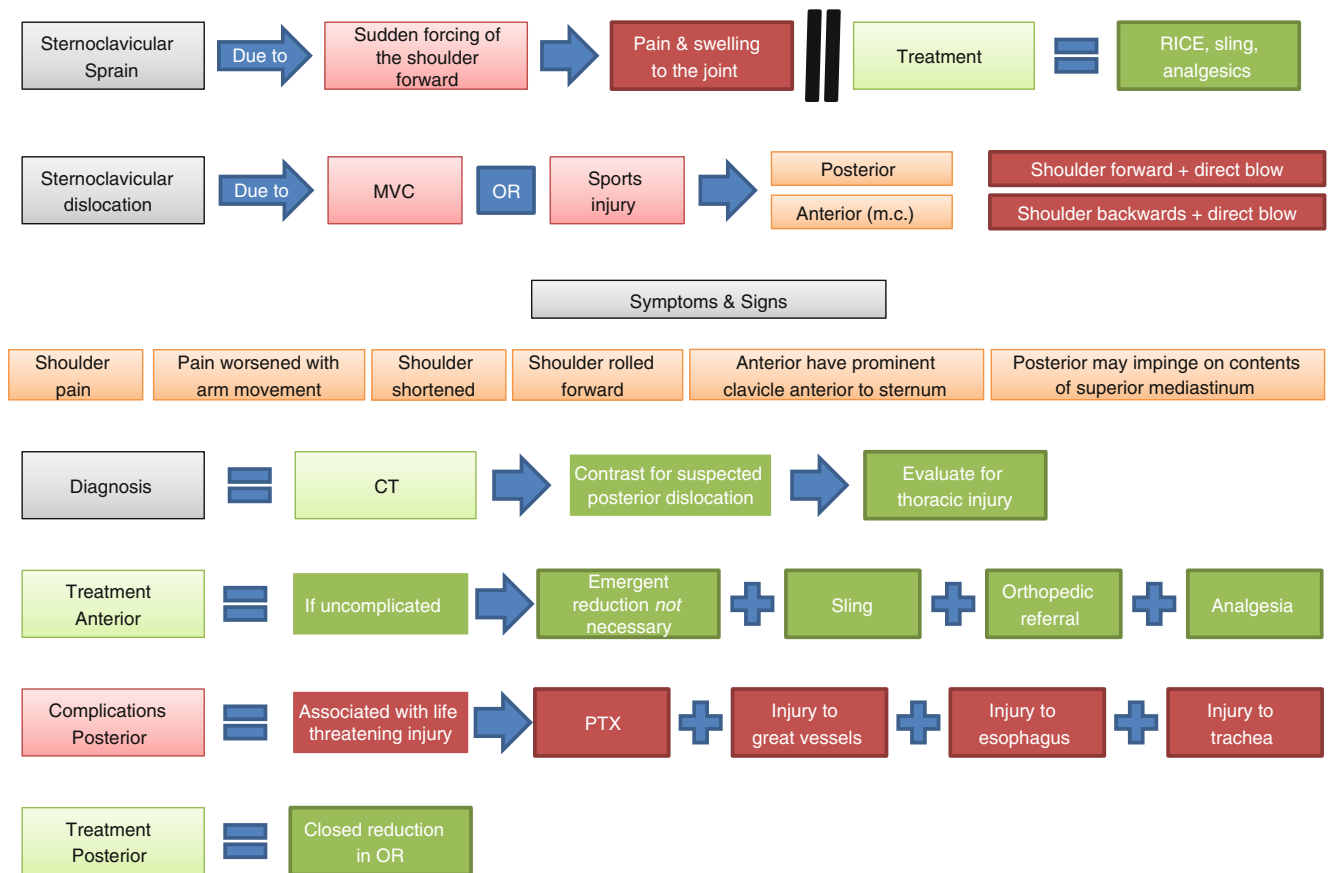


Left center image (Reprinted from Ristevski B, Hall J. Humeral shaft fractures. In: Sethi MK, editor. Orthopedic traumatology: an evidence-based approach. New York: Springer Science. 2014. p. 129–40. With permission from Springer Science + Business Media)

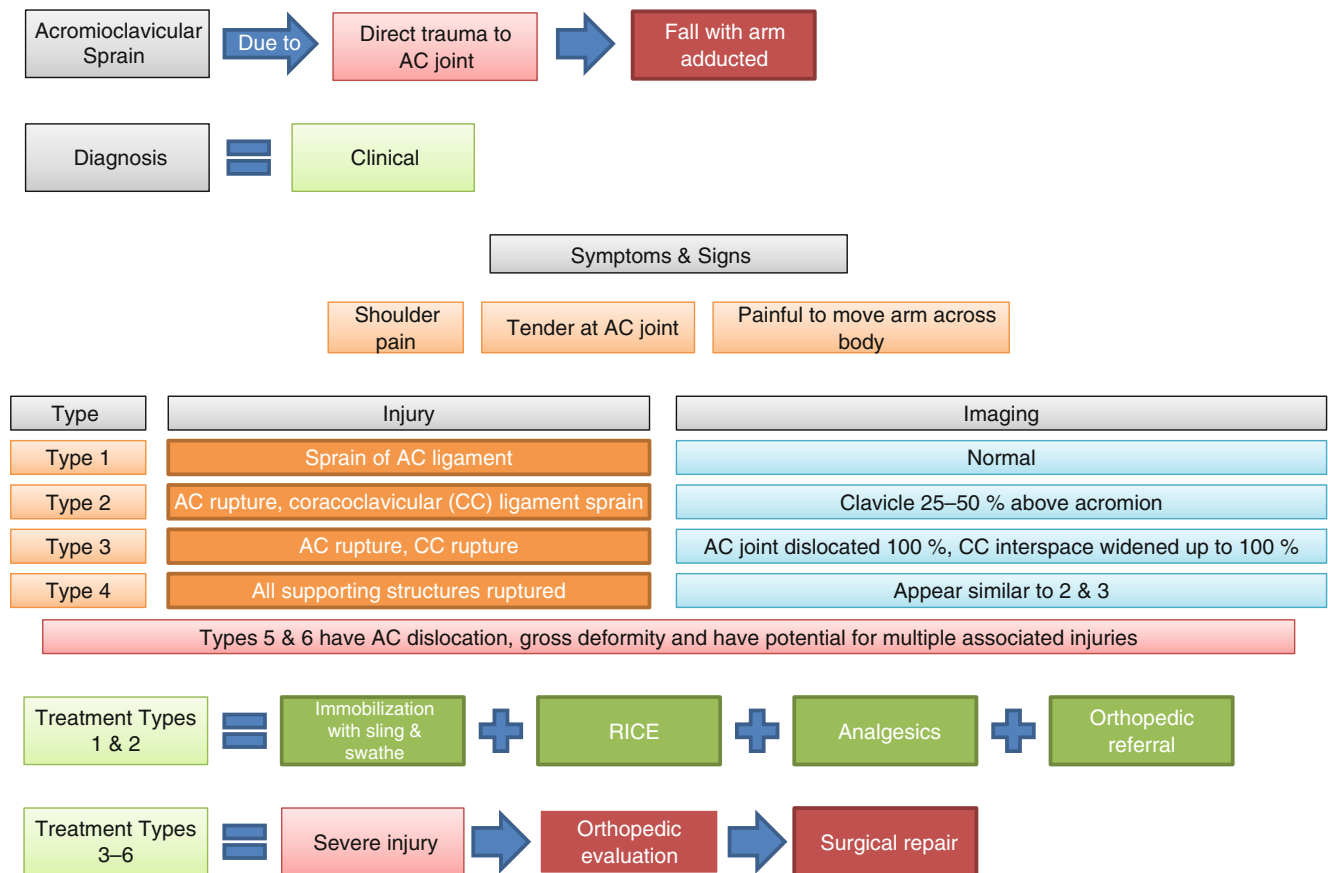
Nontraumatic Shoulder Pain



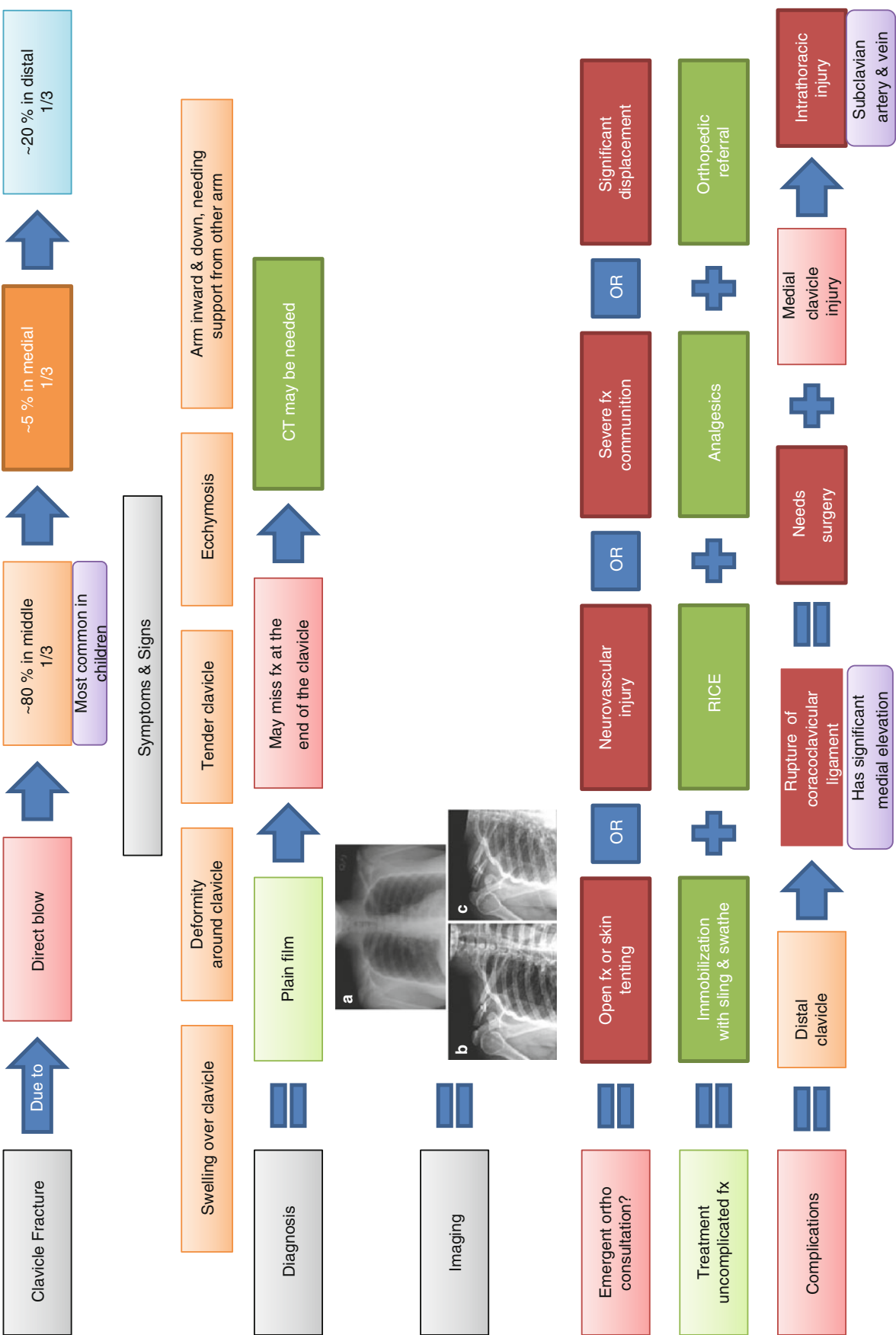
Sternoclavicular Injuries



Acromioclavicular (AC) Injuries

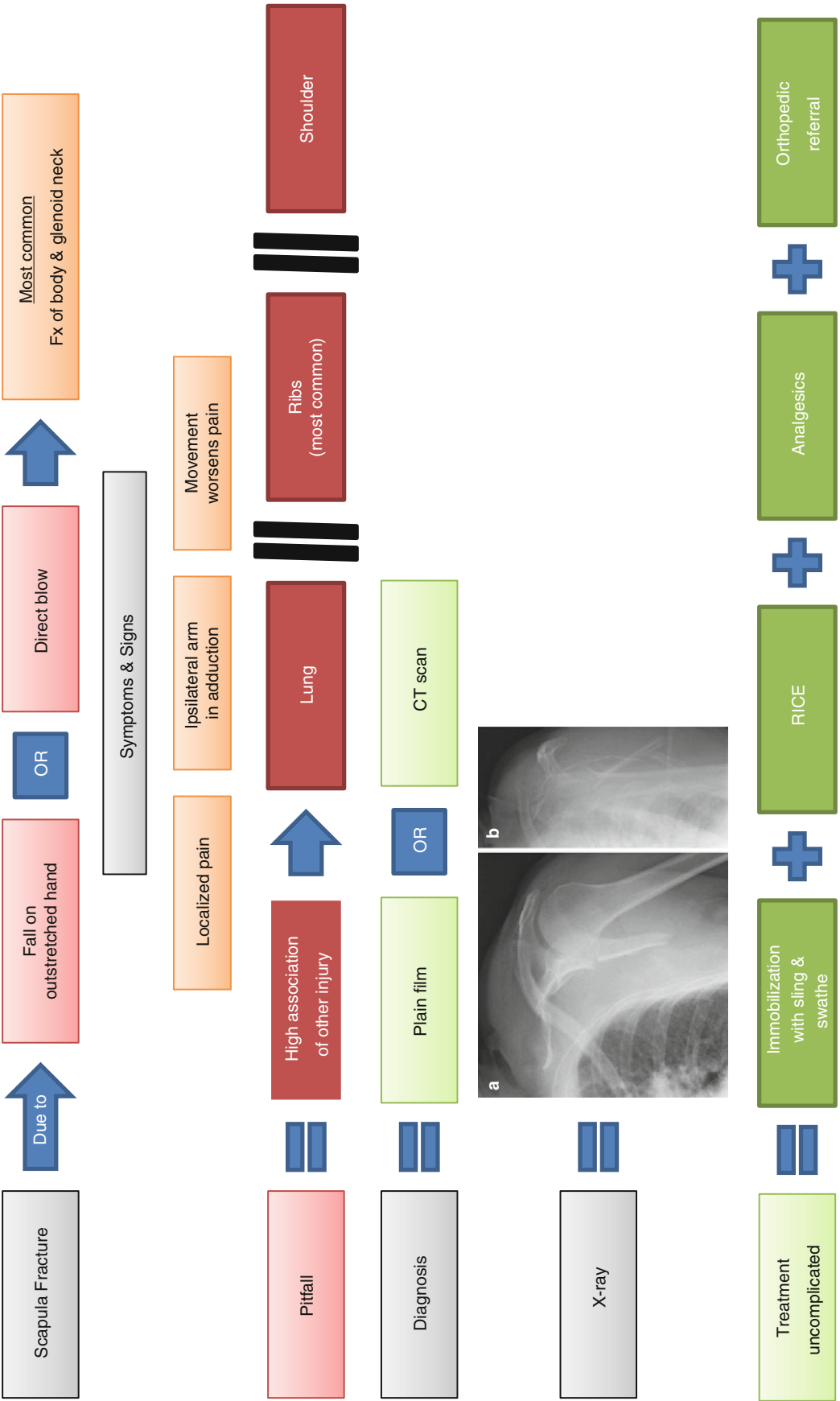


Clavicle Fracture



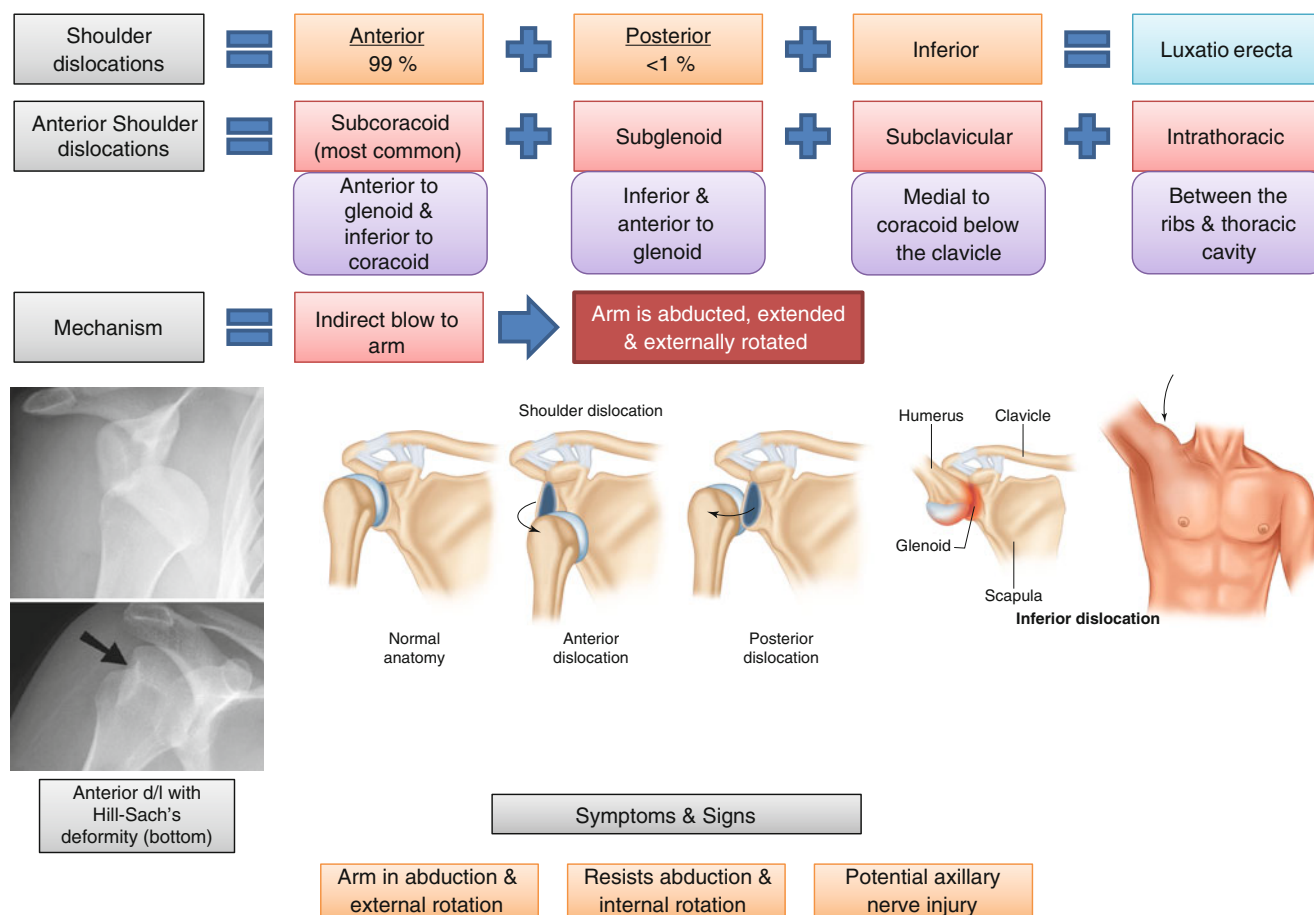
Left center image (Reprinted from Geddes CR, McKee MD. Clavicle fractures. In: Sethi MK, editor. Orthopedic traumatology: an evidence-based approach. New York: Springer Science. 2014. p. 87–102. With permission from Springer Science + Business Media)

Scapula Fracture



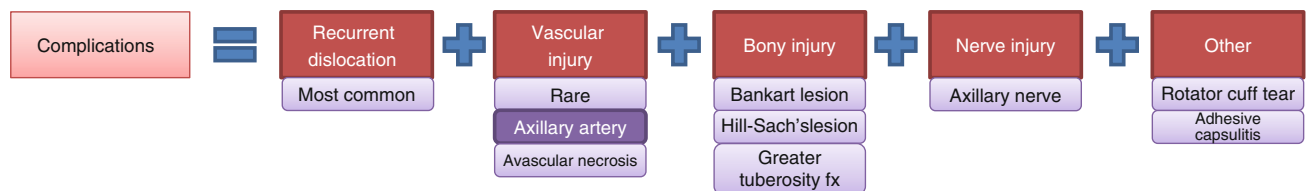
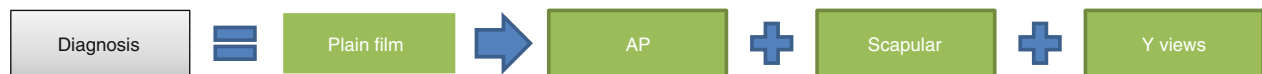
Bottom center image (Reprinted from Cole PA, Hill BW. Scapula fractures. In: Sethi MK, editor. Orthopedic traumatology: an evidence-based approach. New York: Springer Science. 2014. p. 71–86. With permission from Springer Science + Business Media)

Shoulder Dislocations: Anterior



Bottom left image (Reprinted from Missirotli C, Singh A. Emergencies of the biliary tract. In: Singh A, editor. Emergency radiology: Imaging of acute pathologies. New York: Springer Science; 2013. p. 11–25. With permission from Springer Science + Business Media)

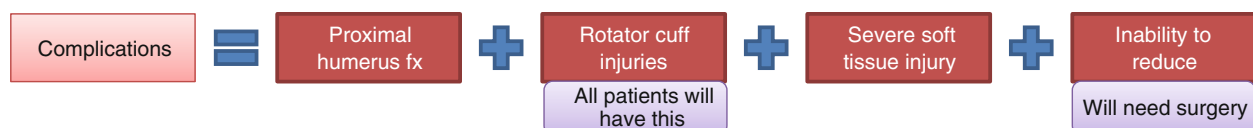
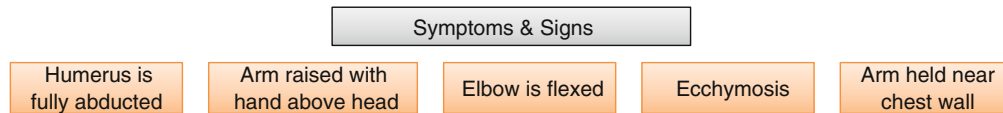
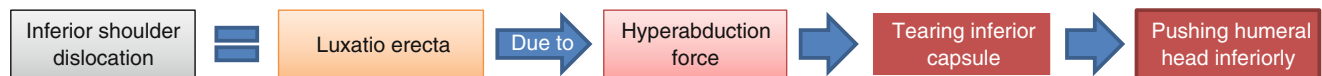
Diagnosis and Treatment: Anterior



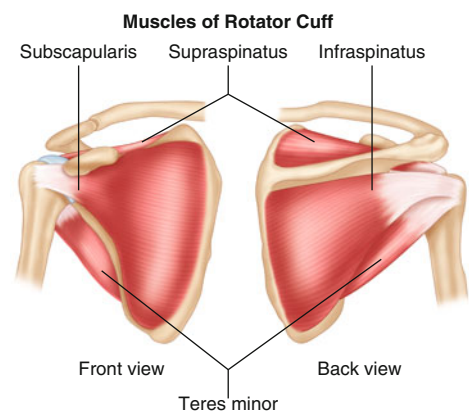
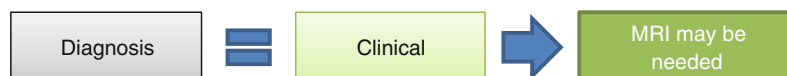
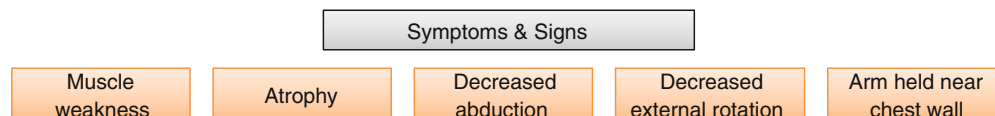
Shoulder Dislocations: Posterior



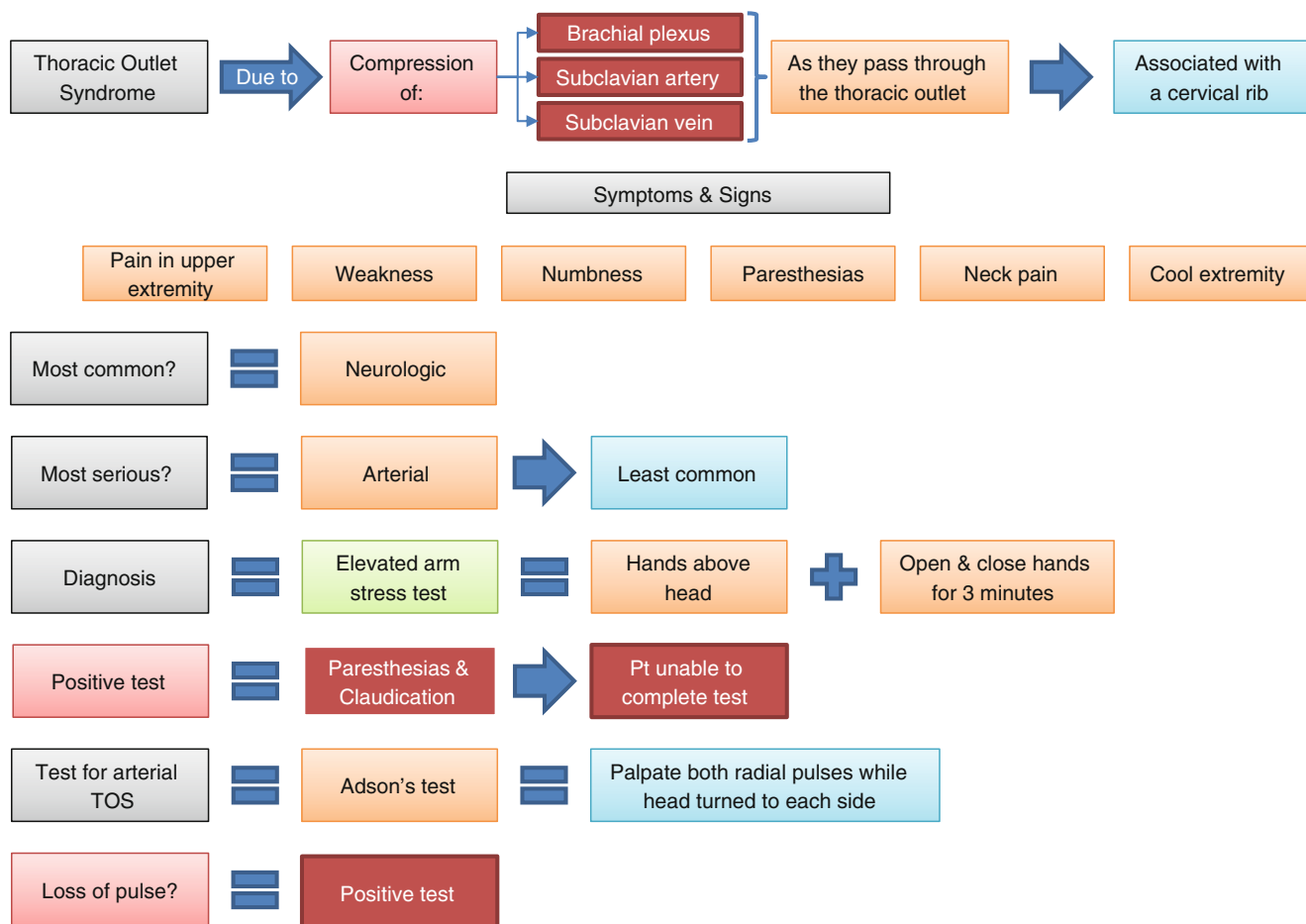
Shoulder Dislocations: Inferior



Rotator Cuff Injuries

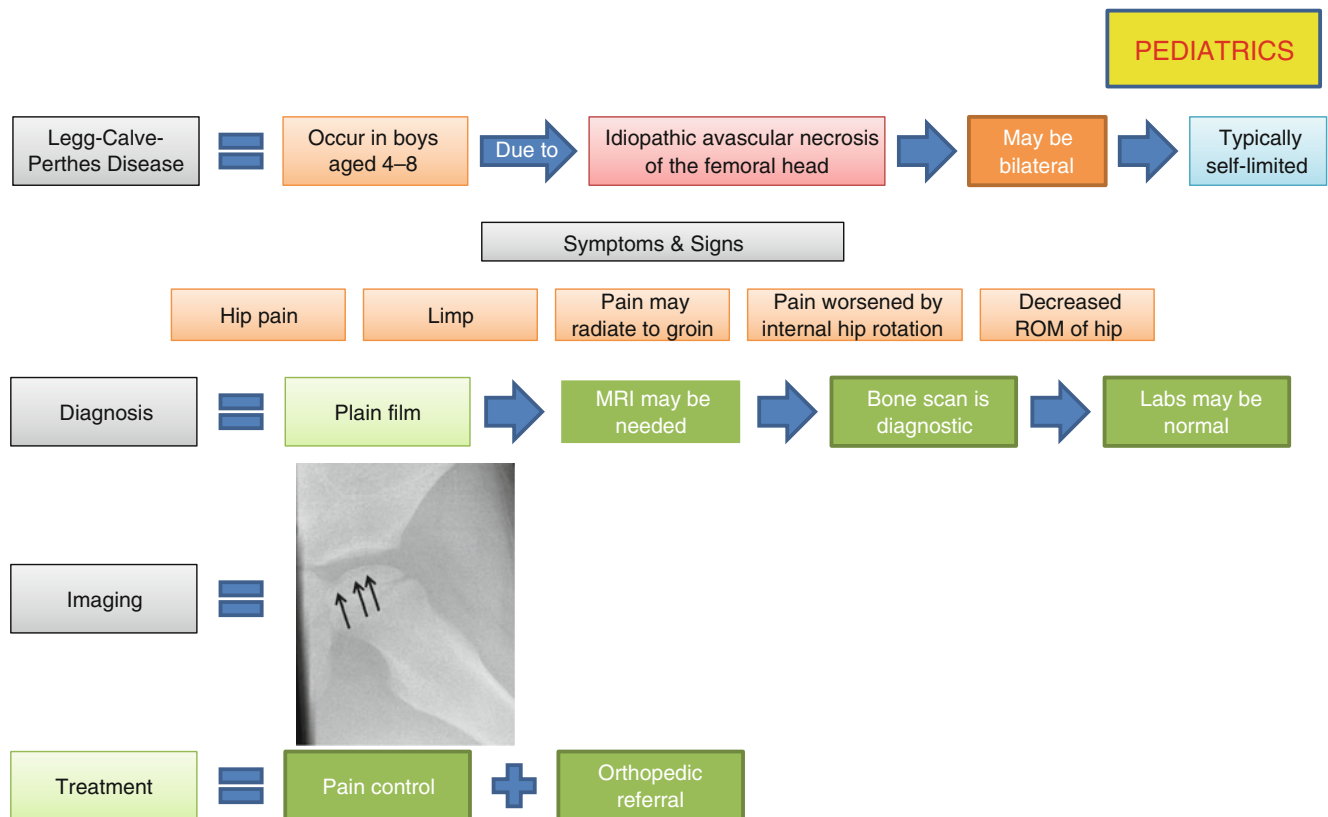


Thoracic Outlet Syndrome (TOS)



Nontraumatic Hip Disorders

Legg-Calve-Perthes Disease



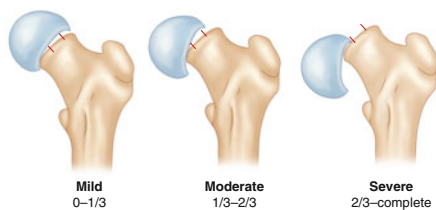
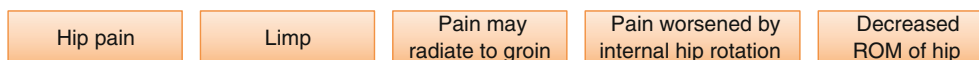
Left center image (Reprinted from Abdelgawad A, Naga O. The hip. In: Abdelgawad A, Naga O, editors. Pediatric orthopedics: a handbook for primary care physicians. New York: Springer; 2014. p. 85–116. With permission from Springer Science + Business Media)

Slipped Capital Femoral Epiphysis

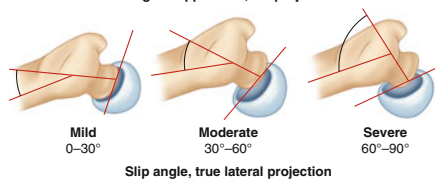
PEDIATRICS



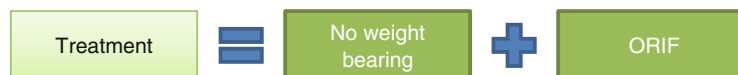
Symptoms & Signs



Change in apposition, AP projection

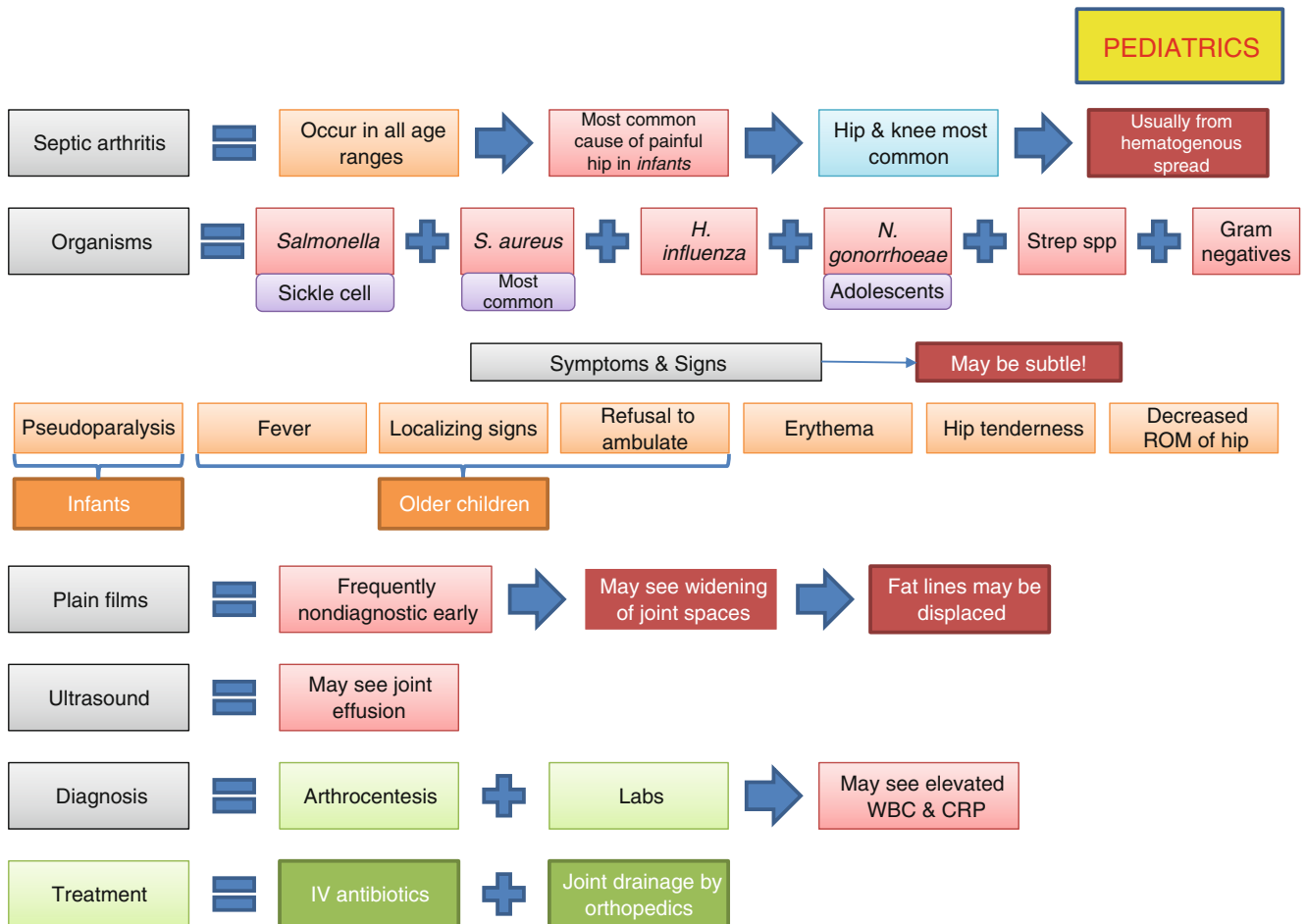


Slip angle, true lateral projection

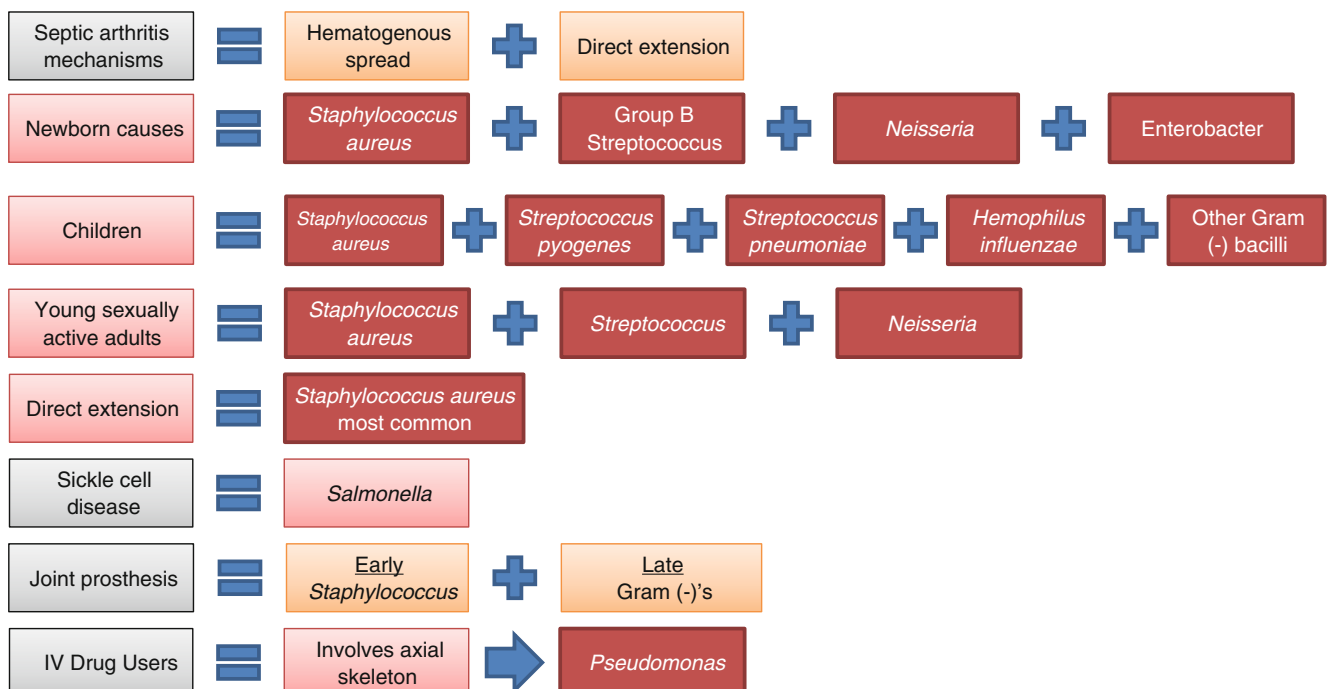


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Septic Arthritis

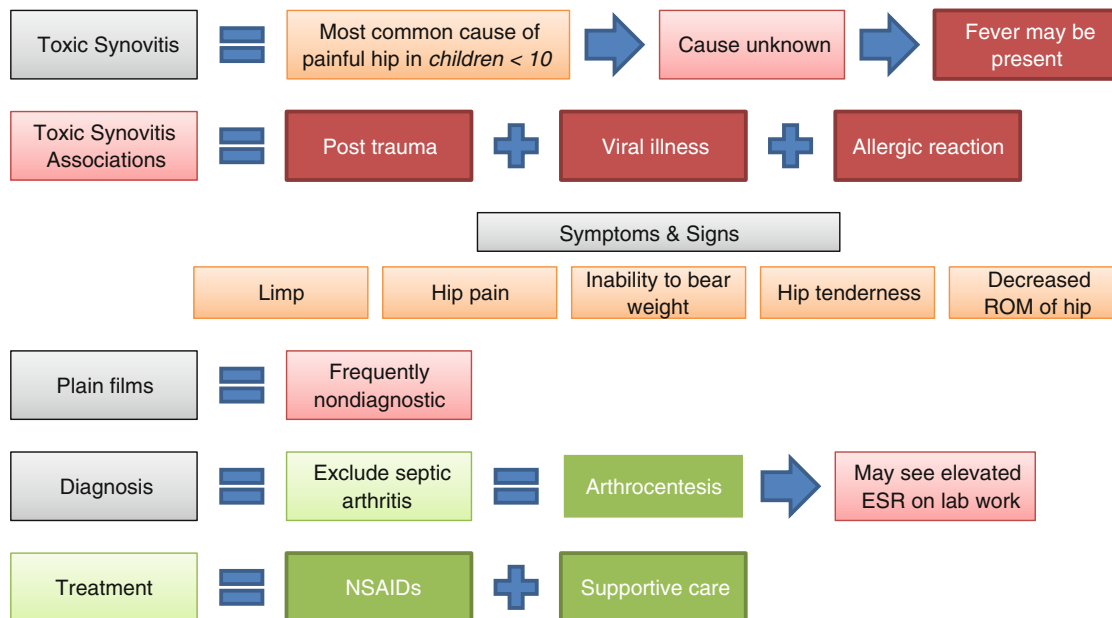


Septic Arthritis Tidbits



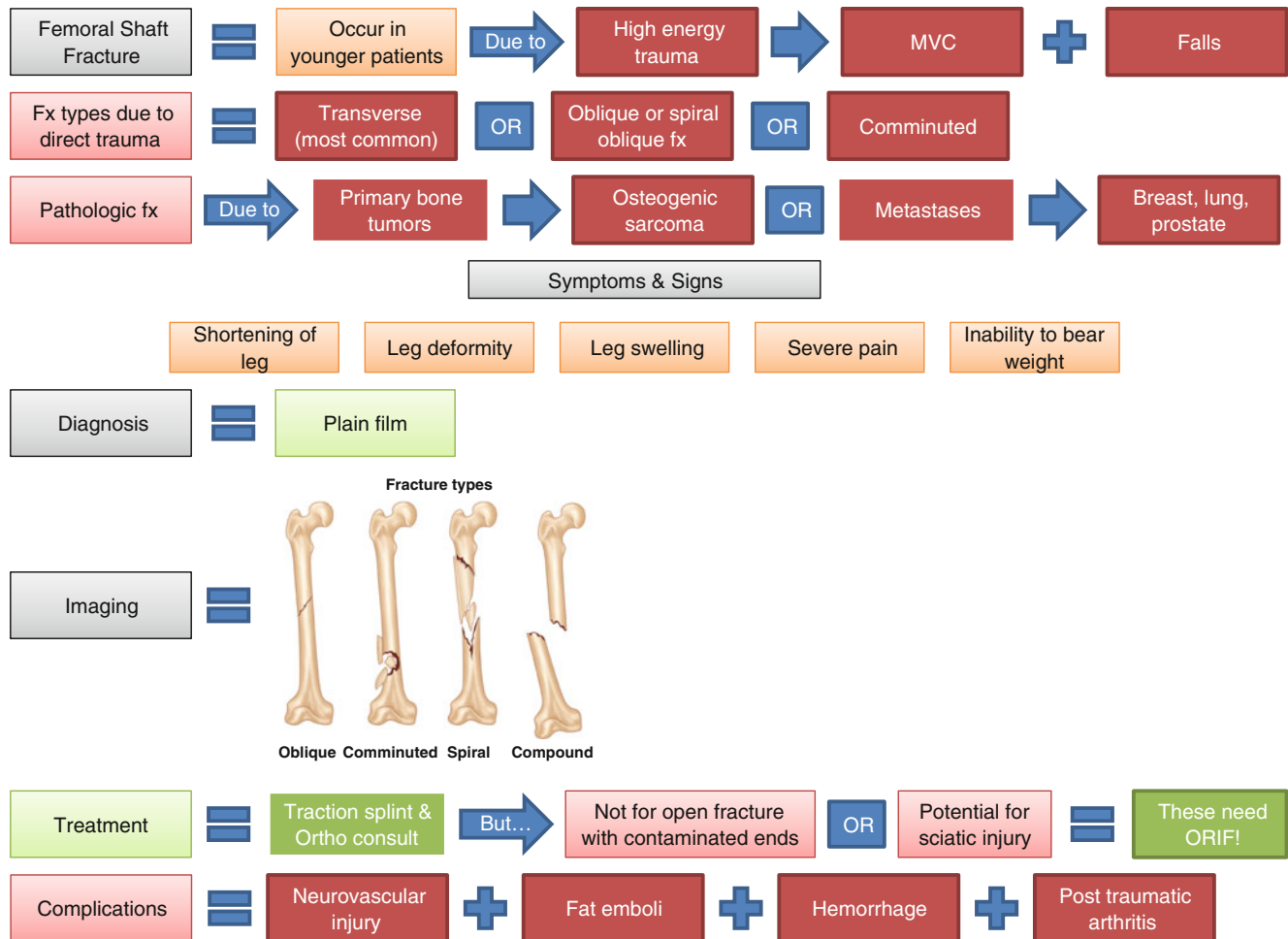
Toxic Synovitis

PEDIATRICS



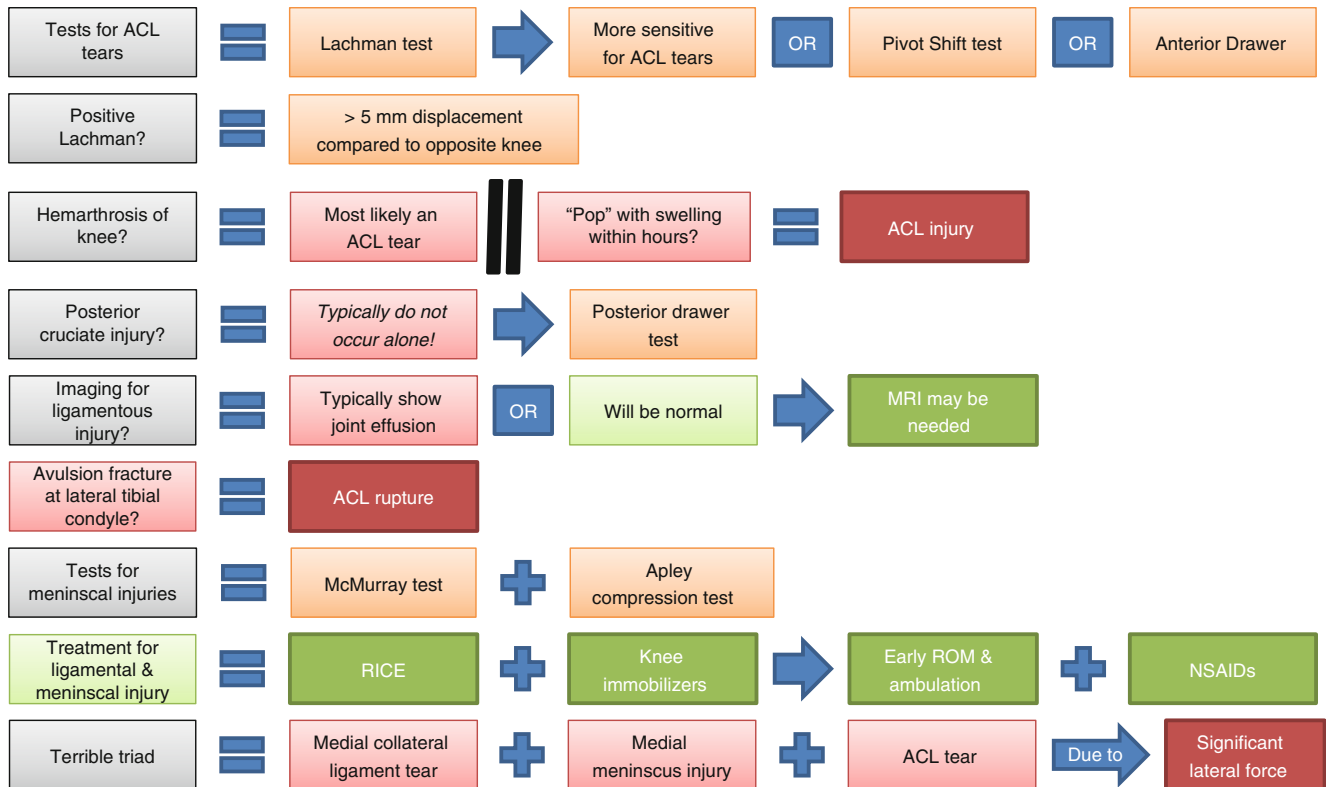
The Femur

Femoral Shaft Fracture

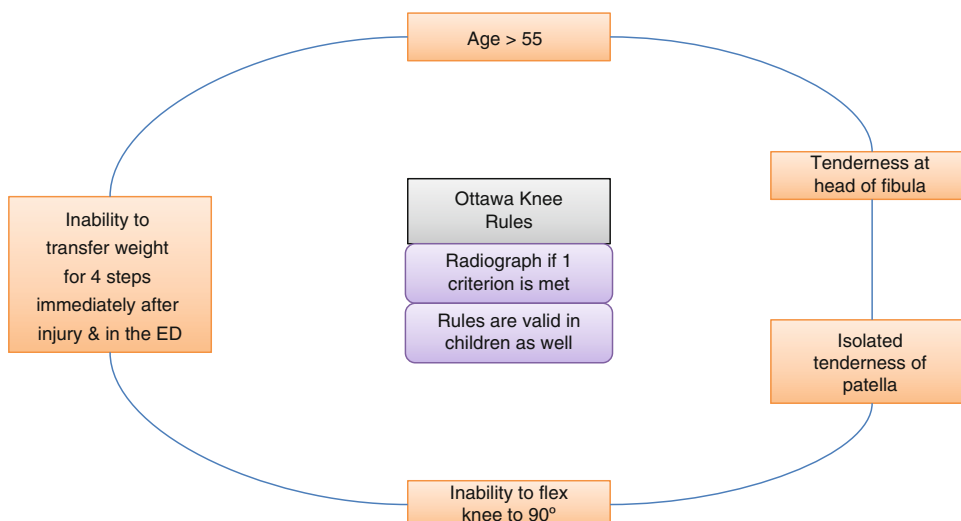


The Knee

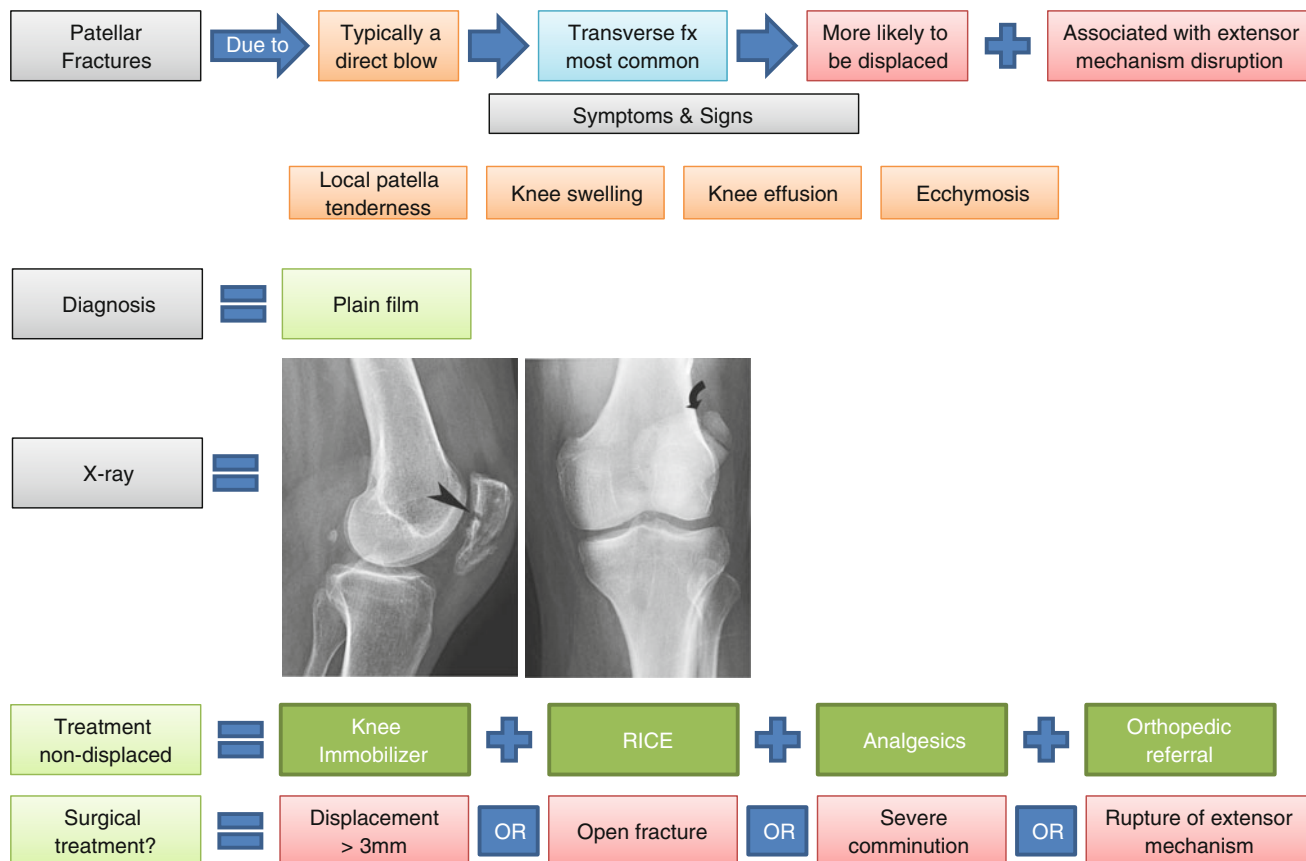
The Knee Tidbits



Ottawa Knee Rules



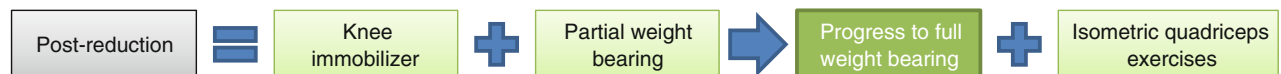
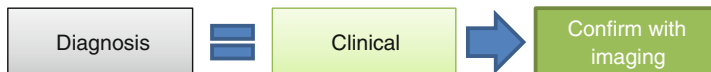
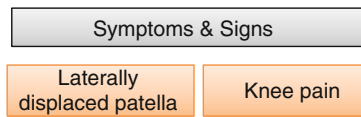
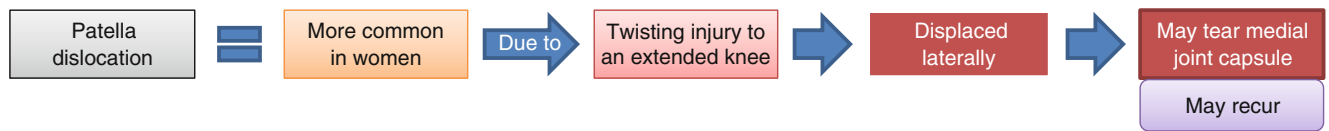
Patellar Fractures



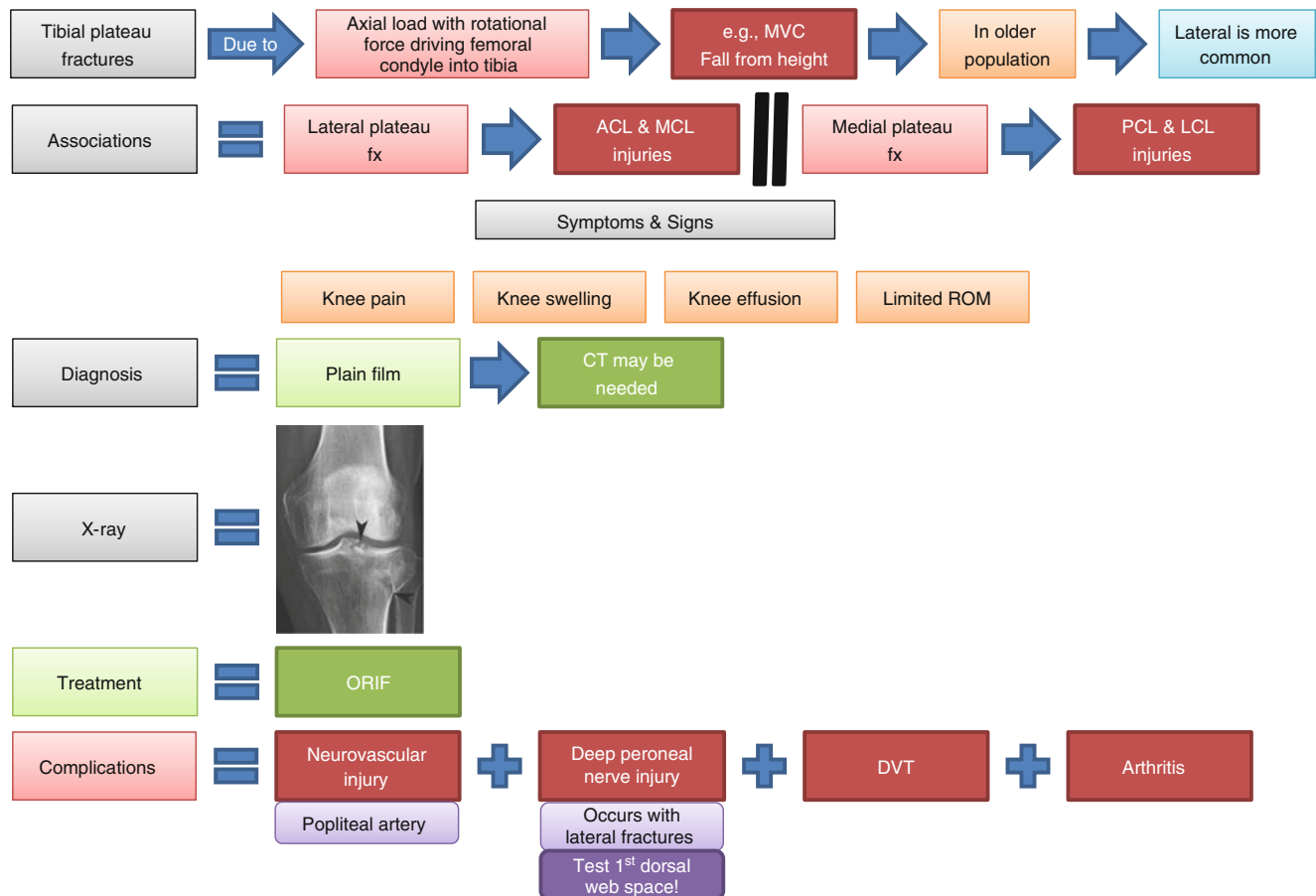
Left center image (Reprinted from Kaewlai R, Singh A. Lower extremity trauma. In: Singh A, editor. Emergency radiology: imaging of acute pathologies. New York: Springer Science; 2013. p. 277–98. With permission from Springer Science + Business Media)

Center image (Reprinted from Kaewlai R, Singh A. Lower extremity trauma. In: Singh A, editor. Emergency radiology: imaging of acute pathologies. New York: Springer Science; 2013. p. 277–98. With permission from Springer Science + Business Media)

Patellar Dislocation

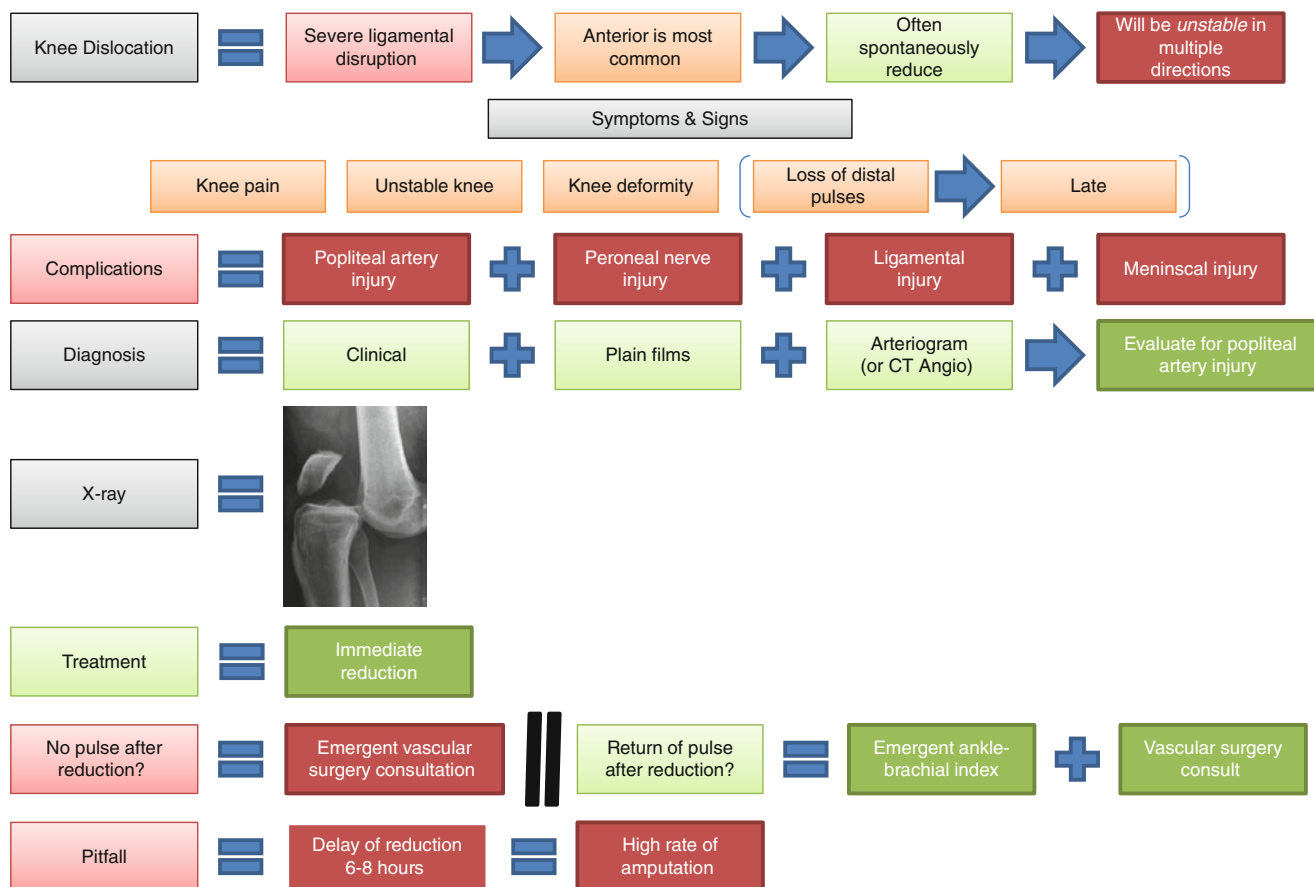


Tibial Plateau Fractures



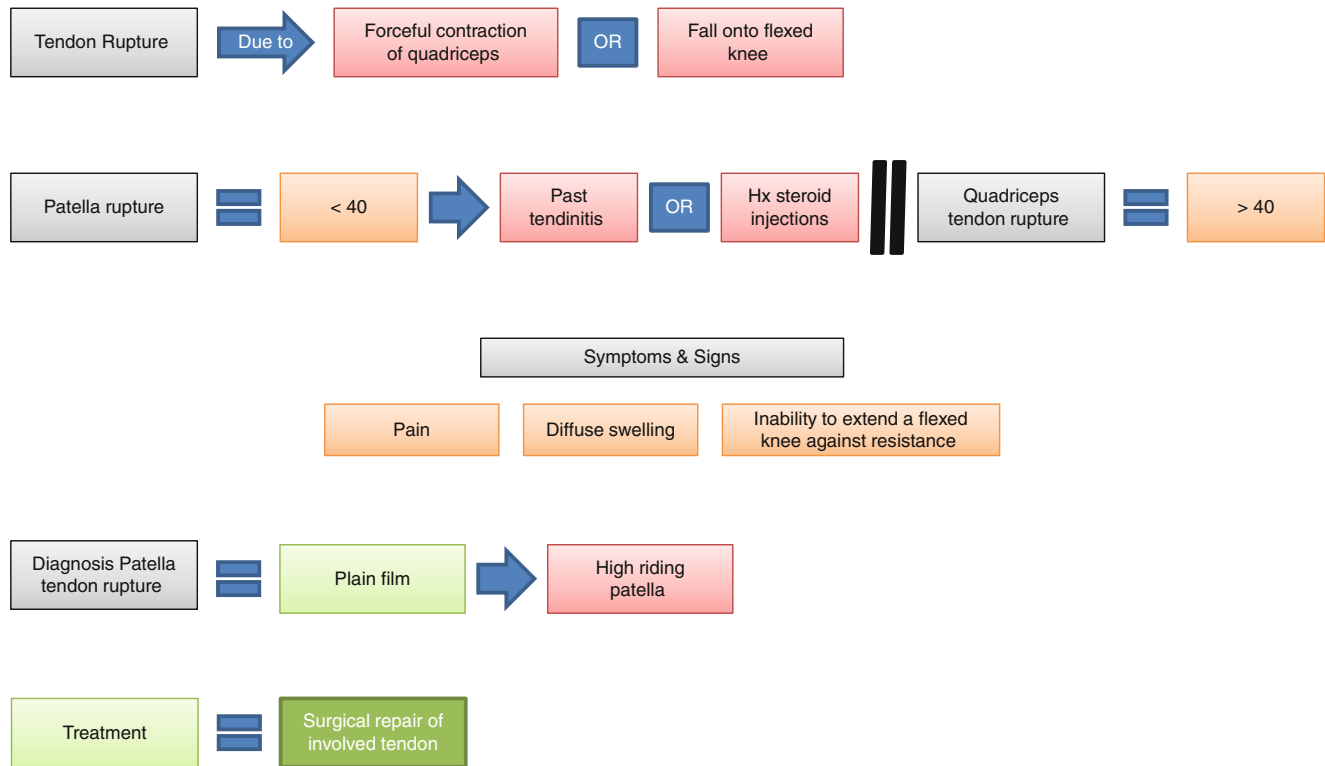
Left center image (Reprinted from Kaewlai R, Singh A. Lower extremity trauma. In: Singh A, editor. Emergency radiology: imaging of acute pathologies. New York: Springer Science; 2013. p. 277–98. With permission from Springer Science + Business Media)

Knee Dislocation

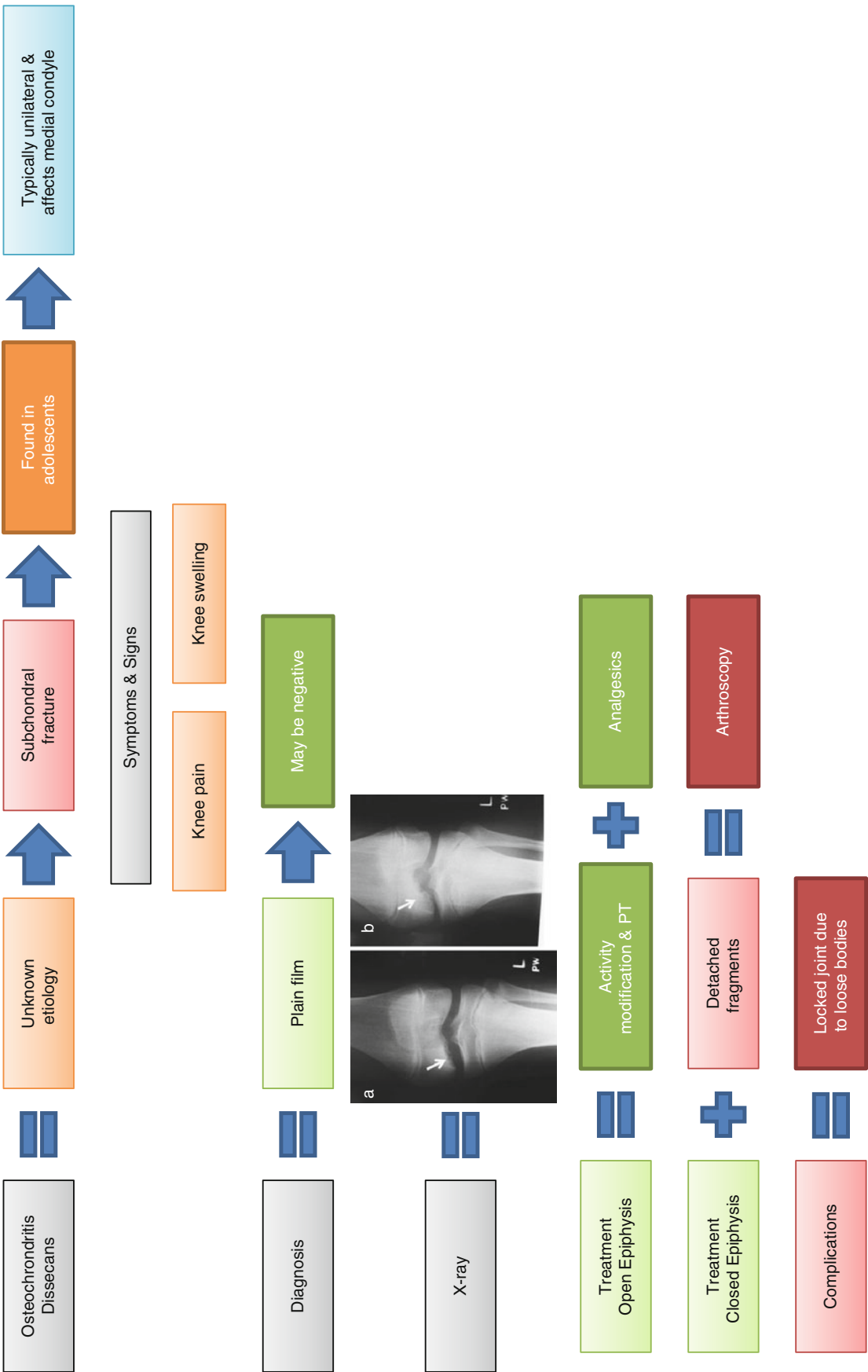


Left center image (Reprinted from Kaewlai R, Singh A. Lower extremity trauma. In: Singh A, editor. Emergency radiology: imaging of acute pathologies. New York: Springer Science; 2013. p. 277–98. With permission from Springer Science + Business Media)

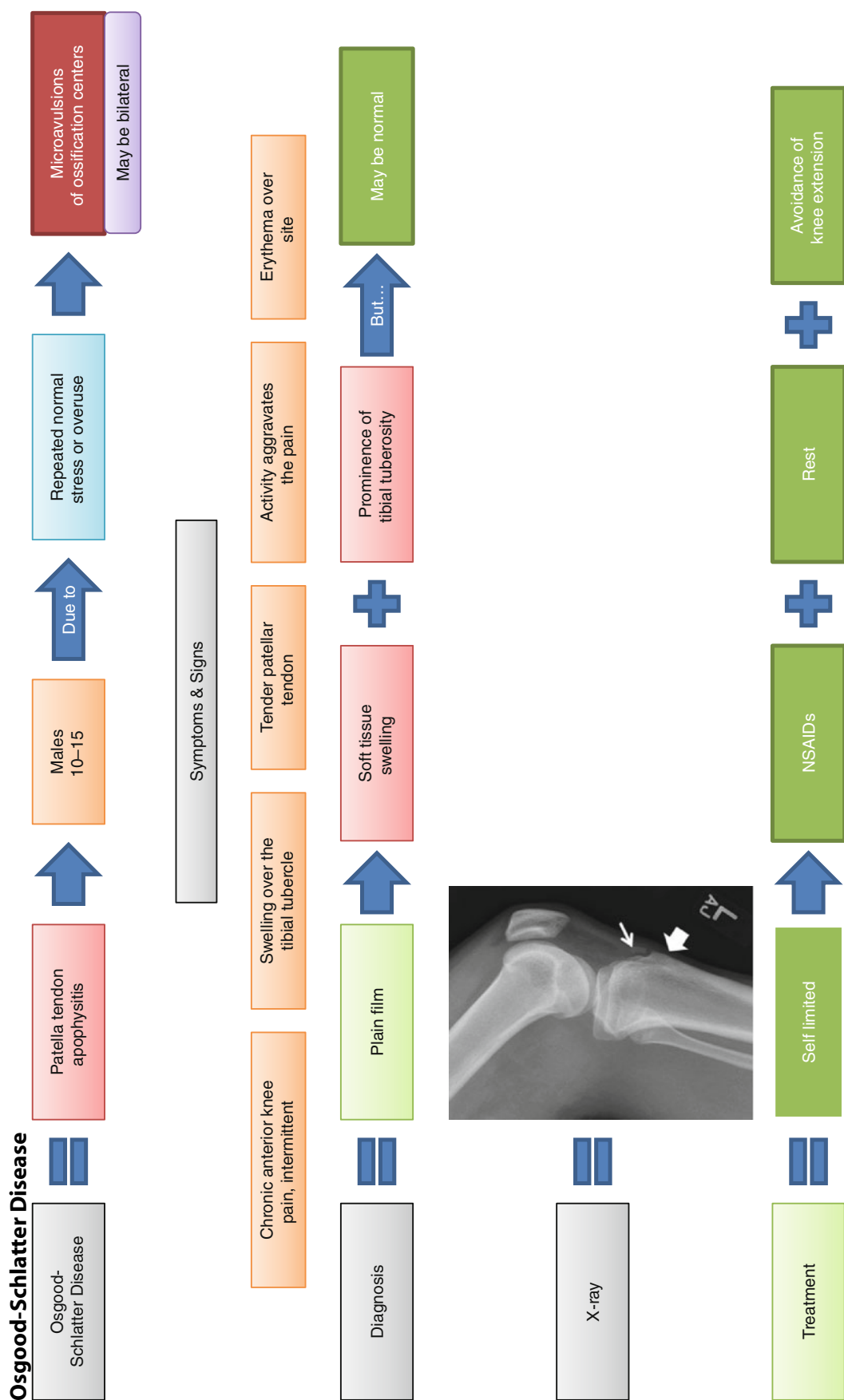
Tendon Rupture: Quadriceps and Patella



Osteochondritis Dissecans

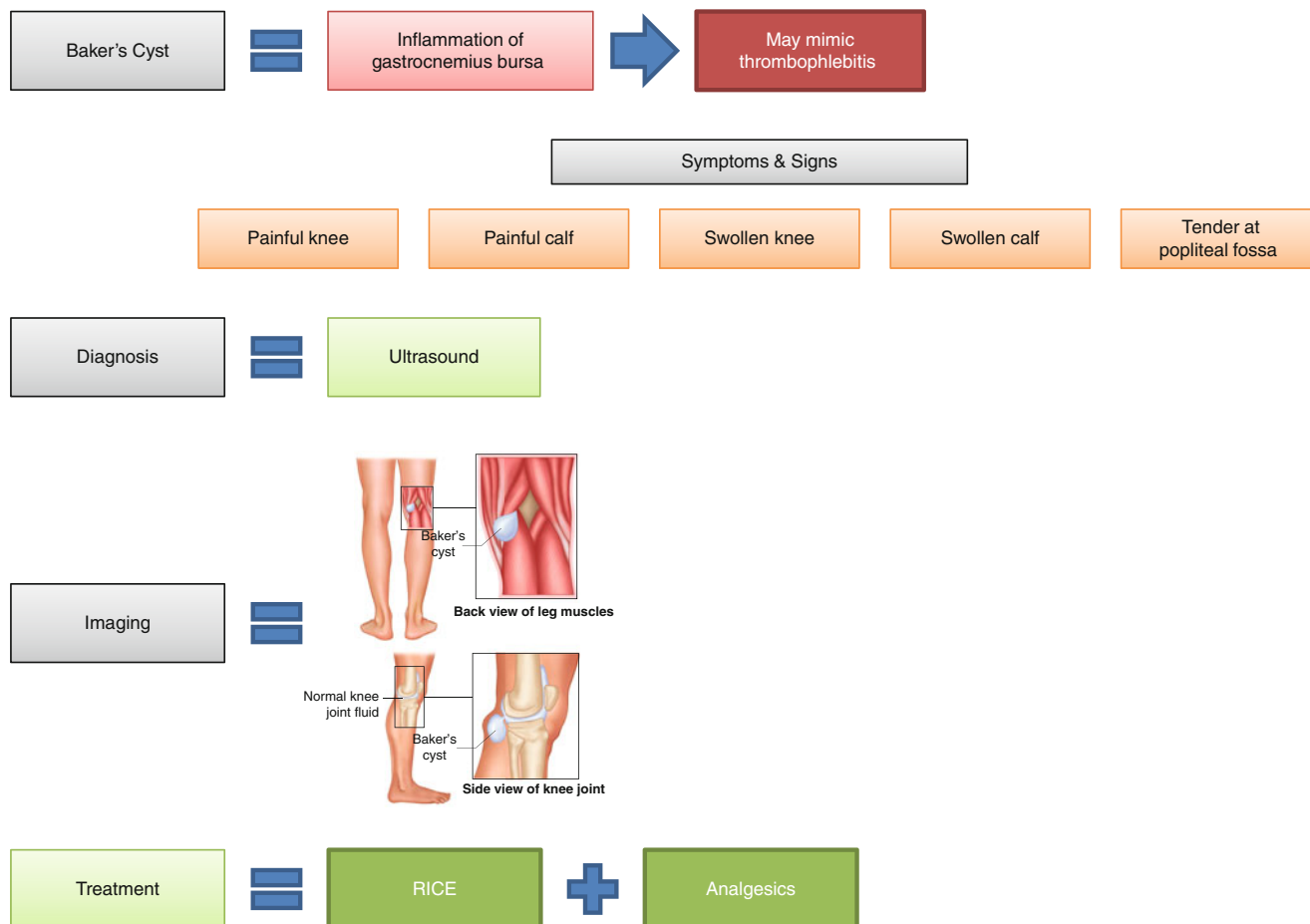


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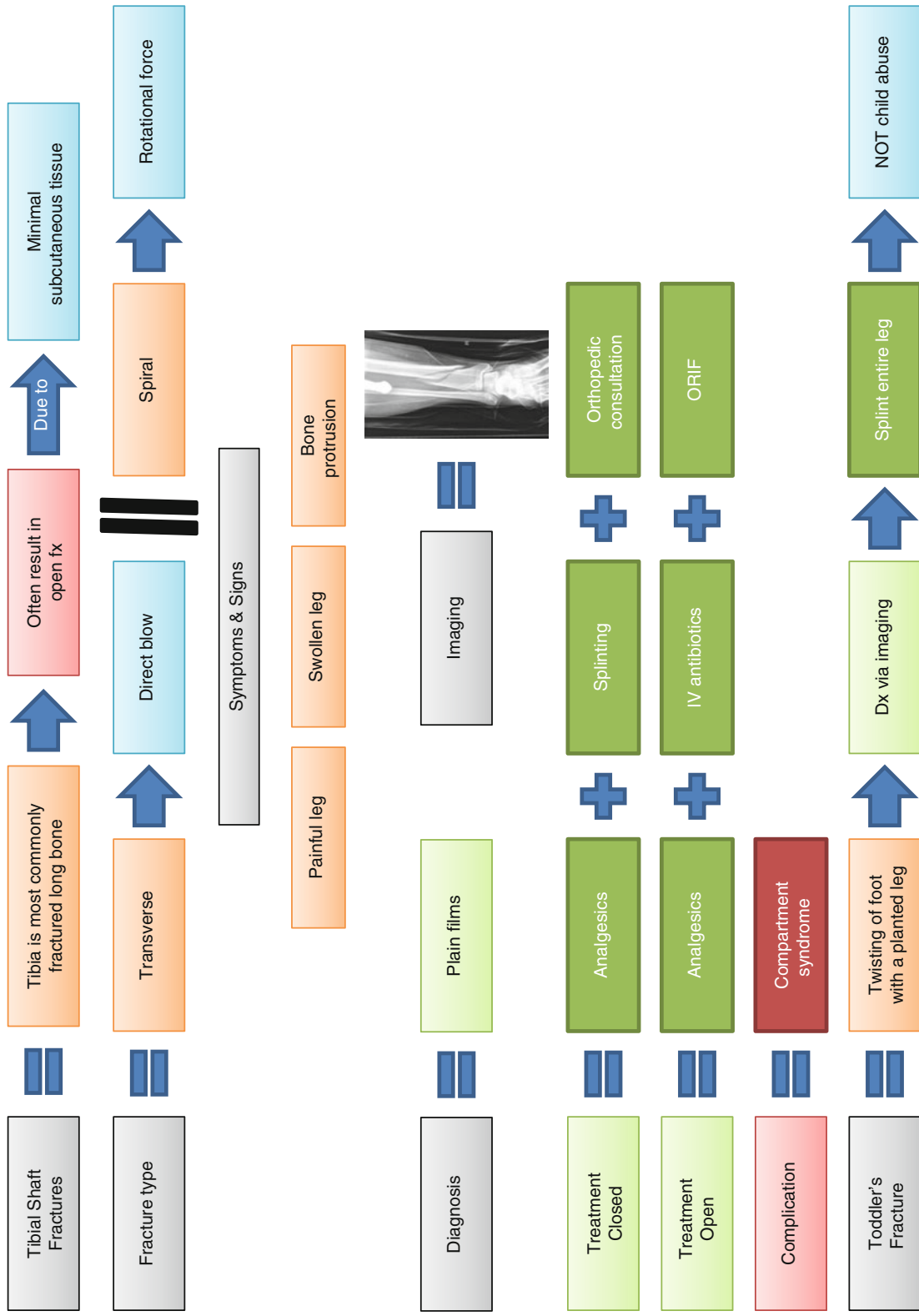
Left center image (Reprinted from Abdelgawad A, Naga O. The knee/leg. In: Abdelgawad A, Naga O, editors. Pediatric orthopedics: a handbook for primary care physicians. New York: Springer; 2014. p. 117–56. With permission from Springer Science + Business Media)

Baker's Cyst



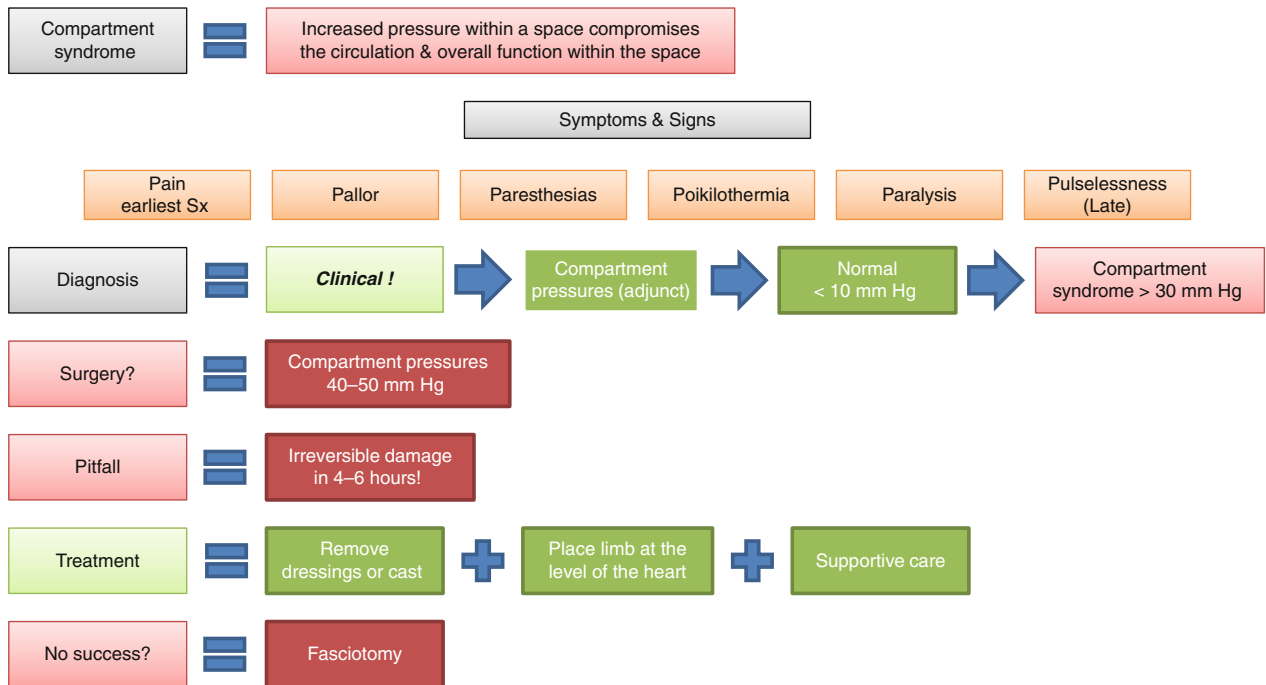
The Leg

Tibial Shaft Fractures

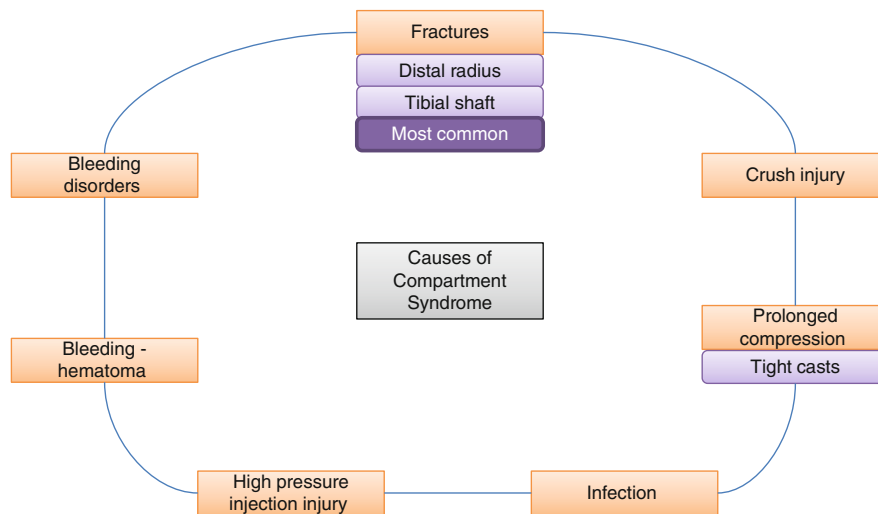


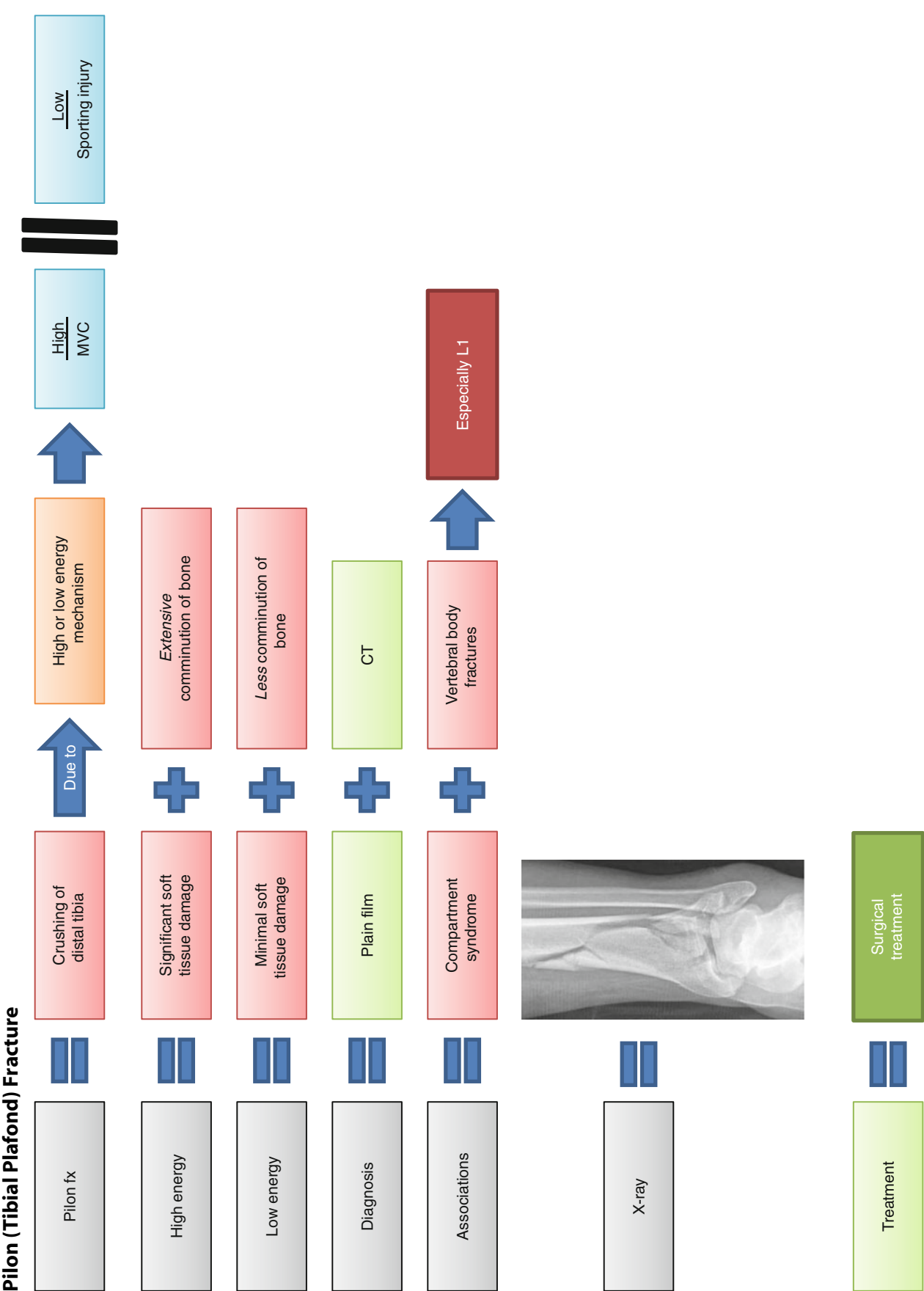
Left center image (Reprinted from Lichte P, Pape H-C. Tibial shaft fractures. In: Oestern HJ, Trentz O, Uranues S, editors. Bone and joint injuries: trauma surgery III. Heidelberg: Springer Verlag; 2014. p. 341–46. With permission from Springer Verlag)

Compartment Syndrome



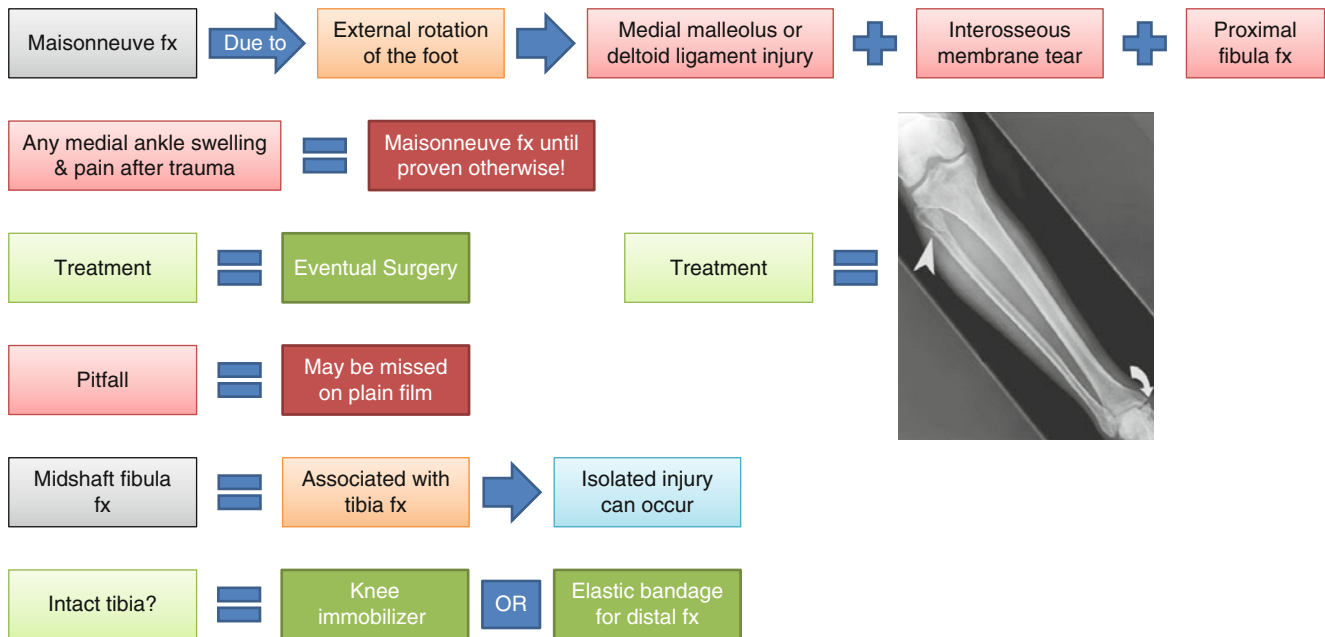
Causes of Compartment Syndrome





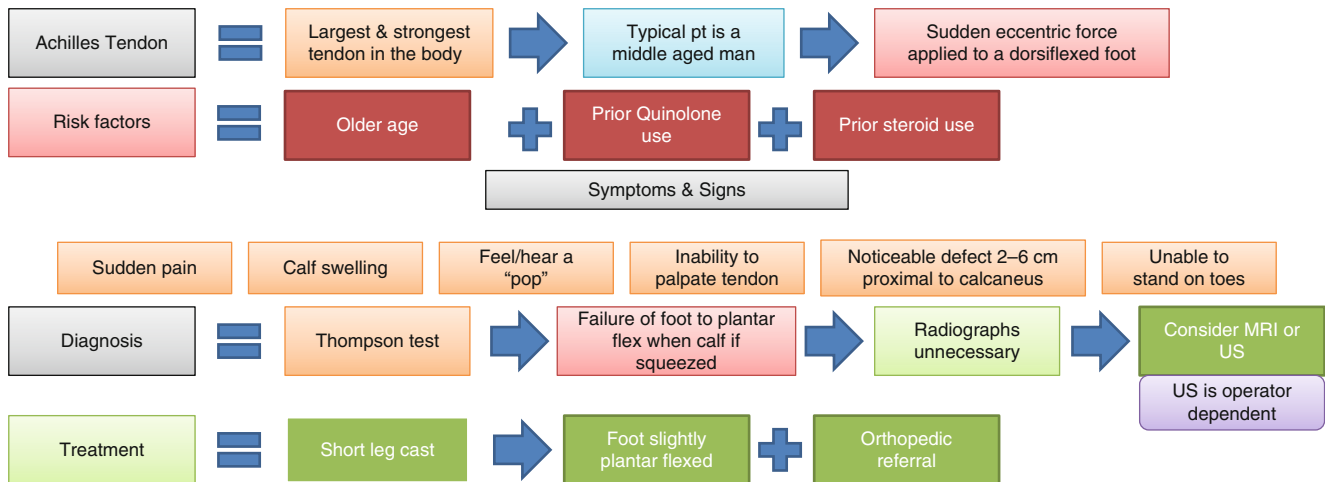
Bottom center image (Reprinted from Kaewlai R, Singh A. Lower extremity trauma. In: Singh A, editor. Emergency radiology: imaging of acute pathologies. New York: Springer Science; 2013. p. 277–98. With permission from Springer Science + Business Media)

Fibula Fracture

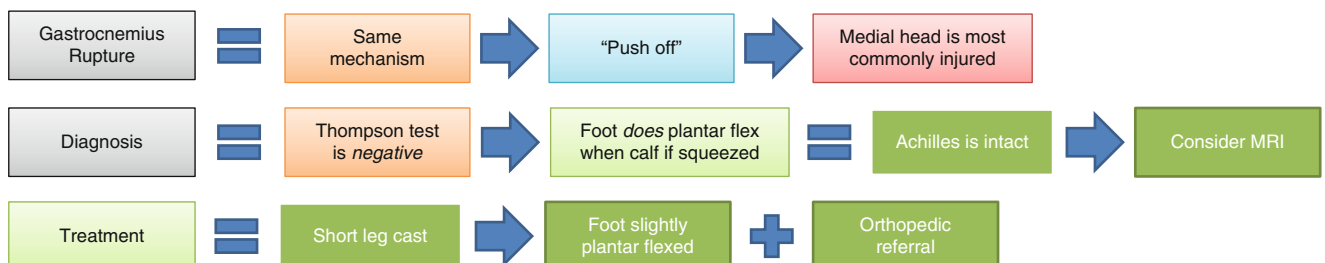


Right center image (Reprinted from Kaewlai R, Singh A. Lower extremity trauma. In: Singh A, editor. Emergency radiology: imaging of acute pathologies. New York: Springer Science; 2013. p. 277–98. With permission from Springer Science + Business Media)

Achilles Tendon Rupture

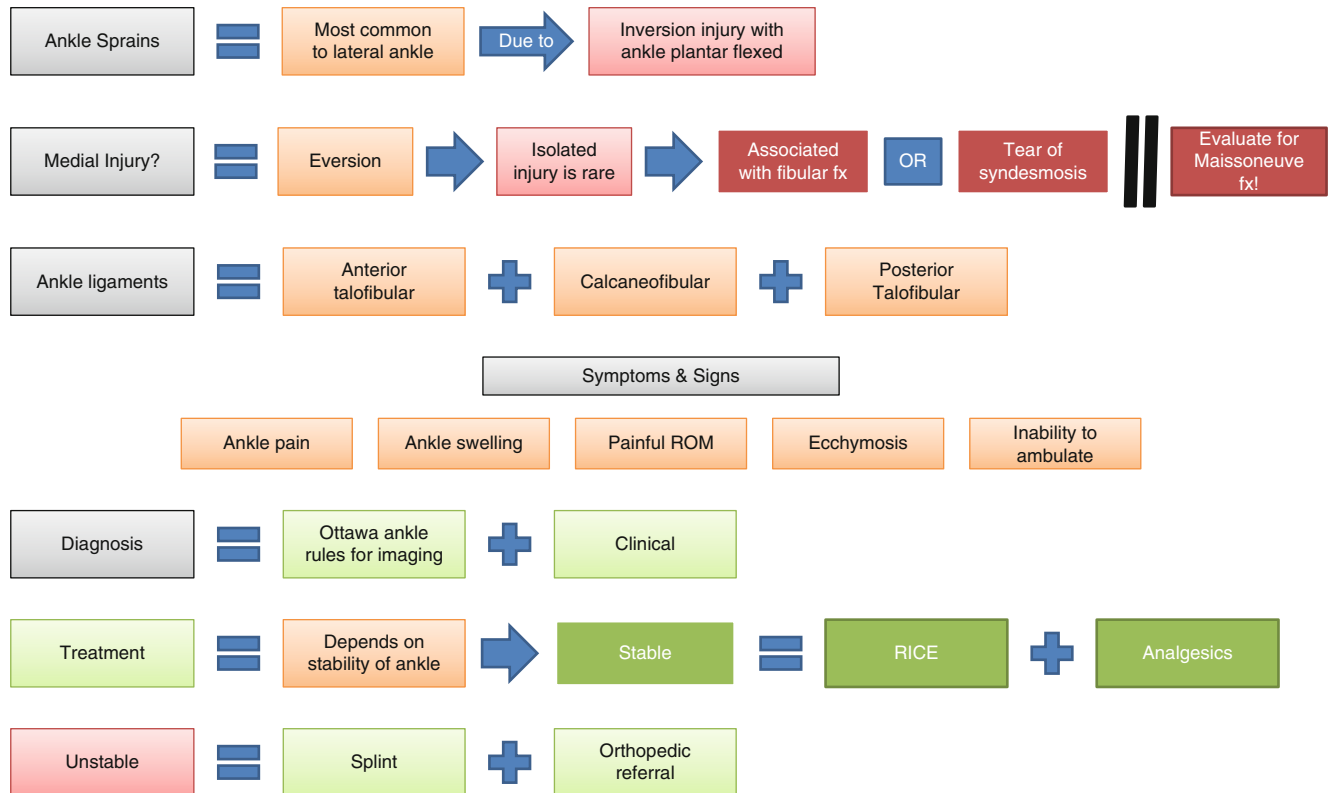


Gastrocnemius Rupture

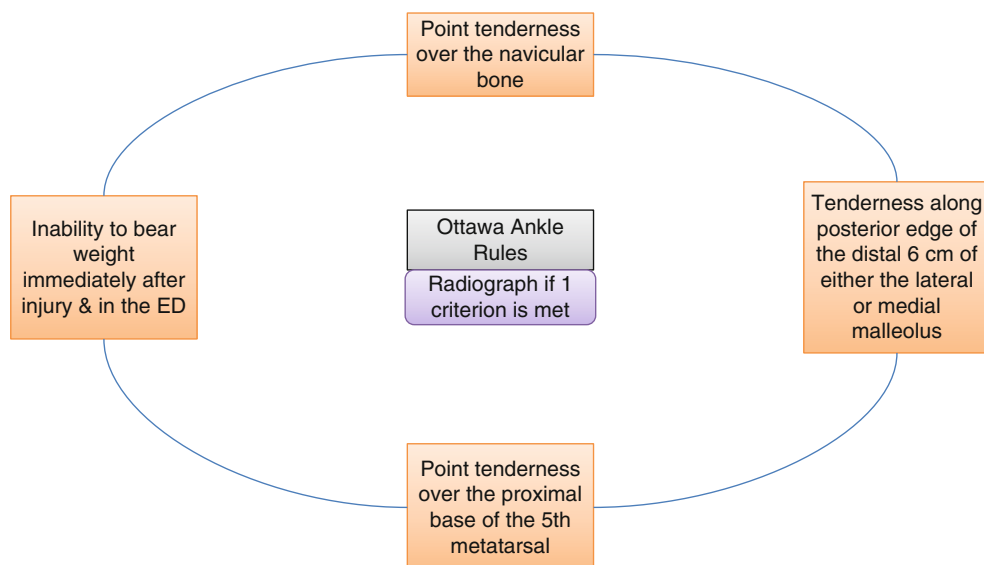


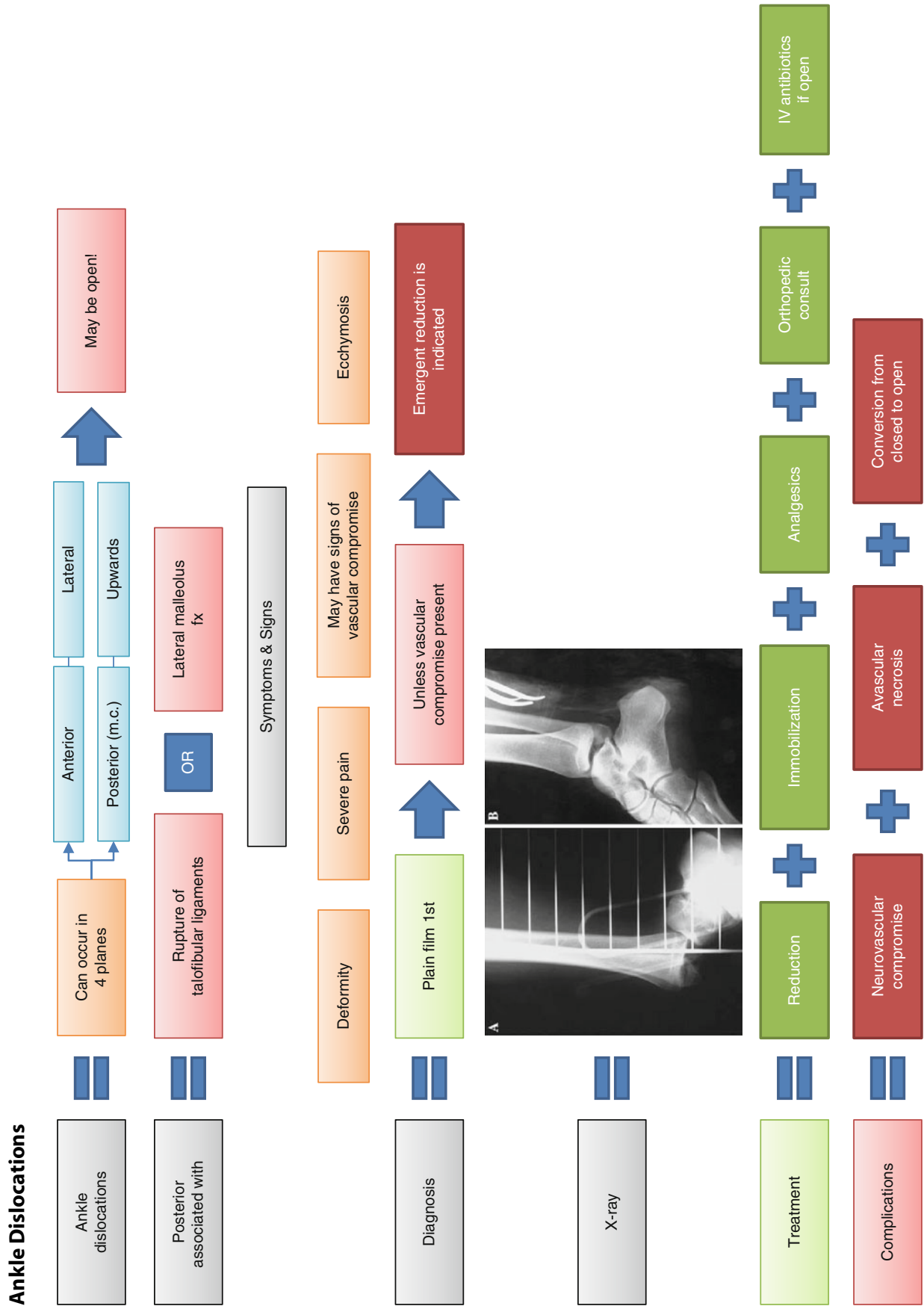
The Ankle

Ankle Sprains



Ottawa Ankle Rules

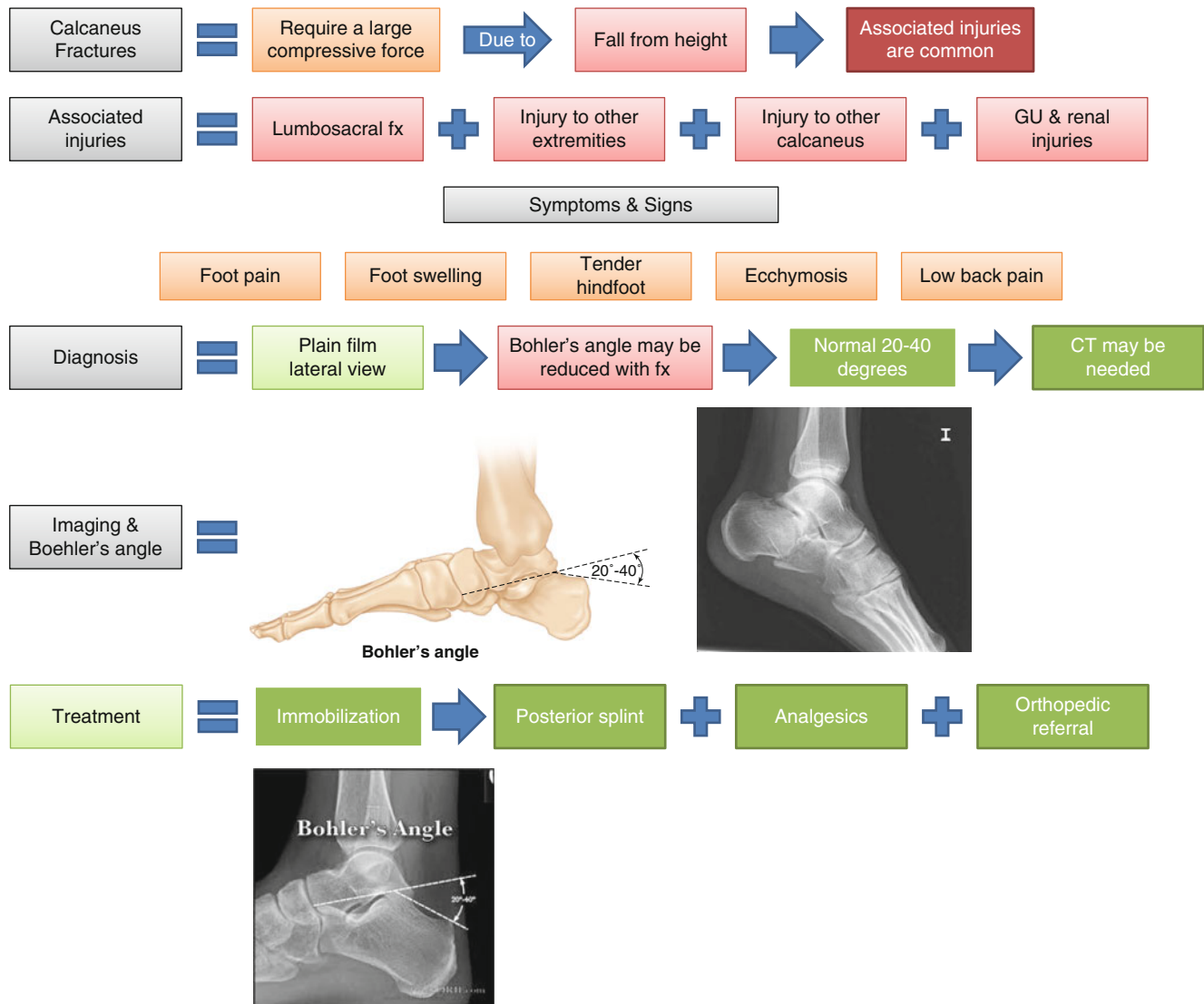




Left center image (Reprinted from Rios-Luna A, Villanueva-Martínez, M, Fahandezh-Saddi H, Pereiro J, Martín-García A. Isolated dislocation of the ankle: two cases and review of the literature. Eur J Orthop Surg Traumatol. 2007;17(4):403–7. With permission from Springer Verlag)

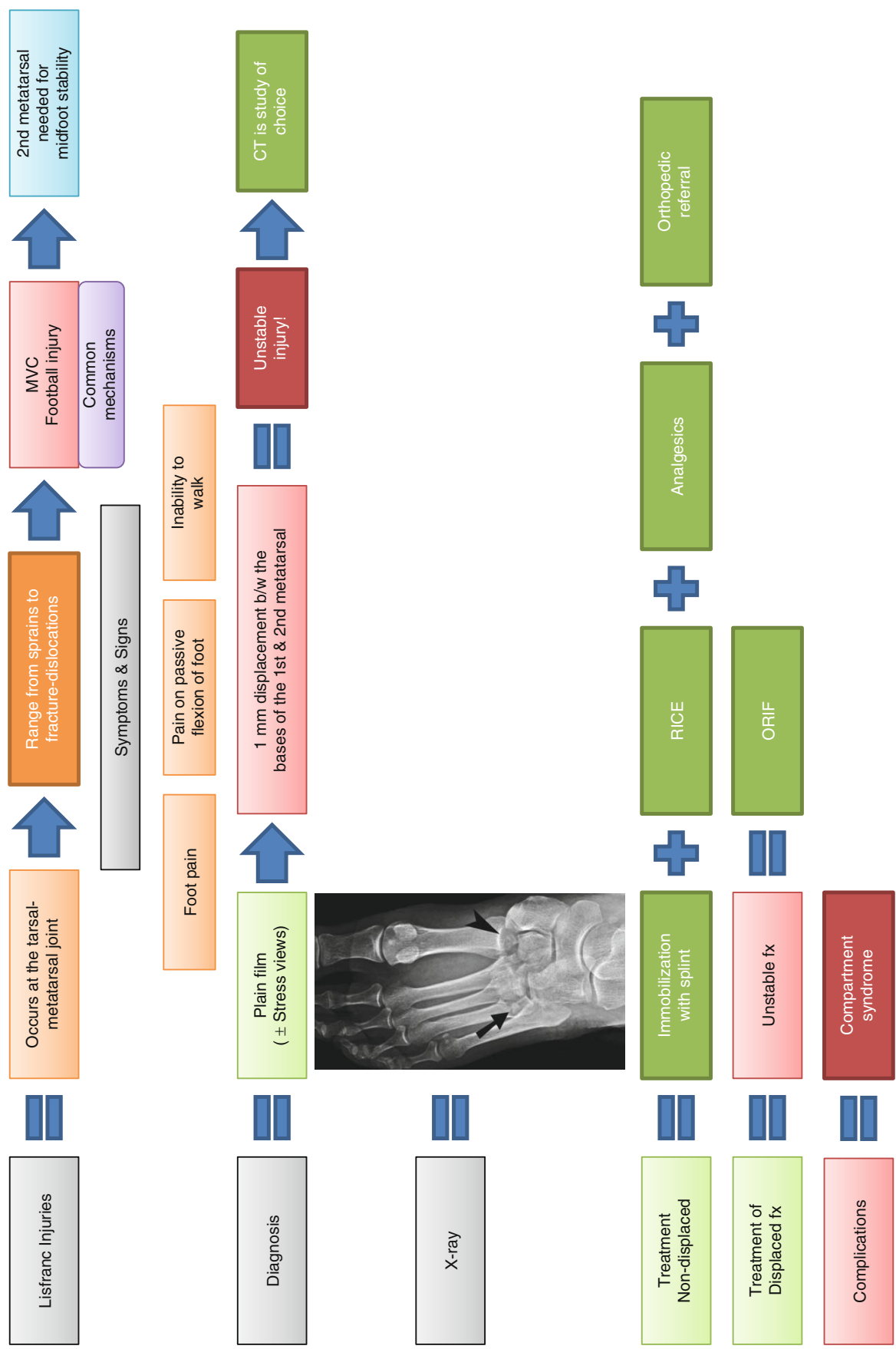
The Foot

Calcaneal Fractures



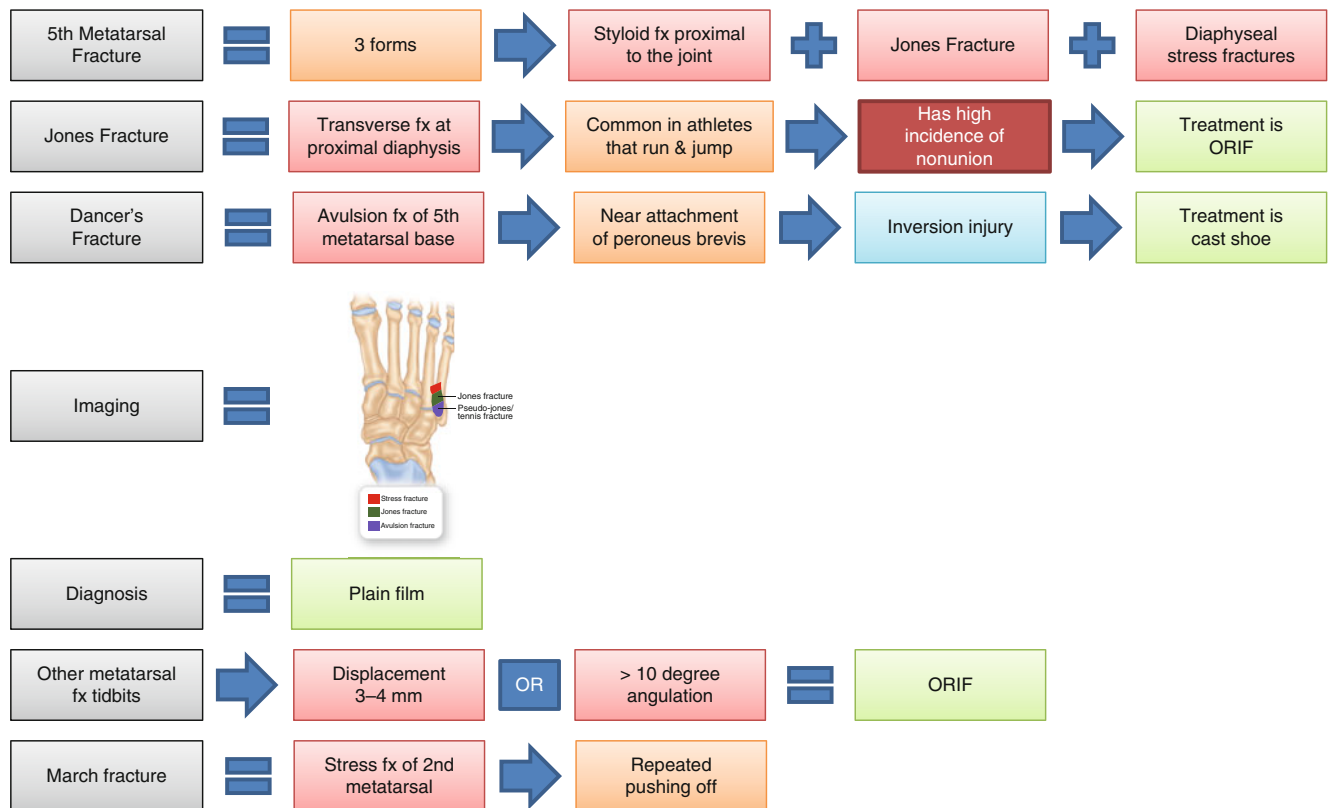
Right center image (Reprinted from García-Rey E. Complex fractures of the calcaneus. In: Rodríguez-Merchán EC, Rubio-Suarez JC, editors. Complex fractures of the limbs. Zug: Springer International Publishing; 2014. p. 95–9. With permission from Springer International Publishing)

Lisfranc Injuries

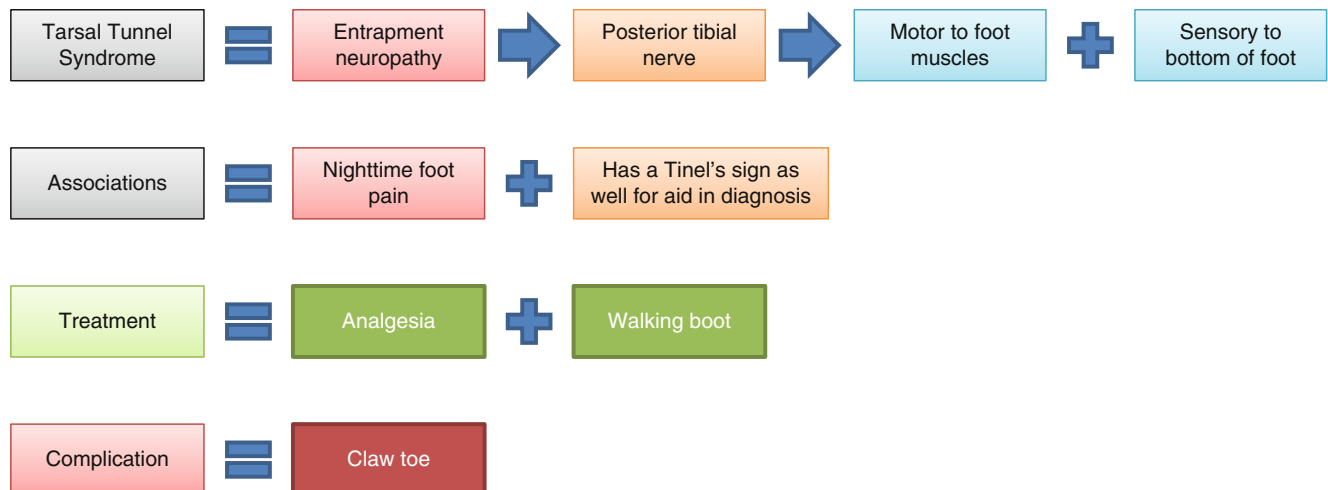


Left center image (Reprinted from Kaewlai R, Singh A. Lower extremity trauma. In: Singh A, editor. Emergency radiology: imaging of acute pathologies. New York: Springer Science; 2013. p. 277–98. With permission from Springer Science + Business Media)

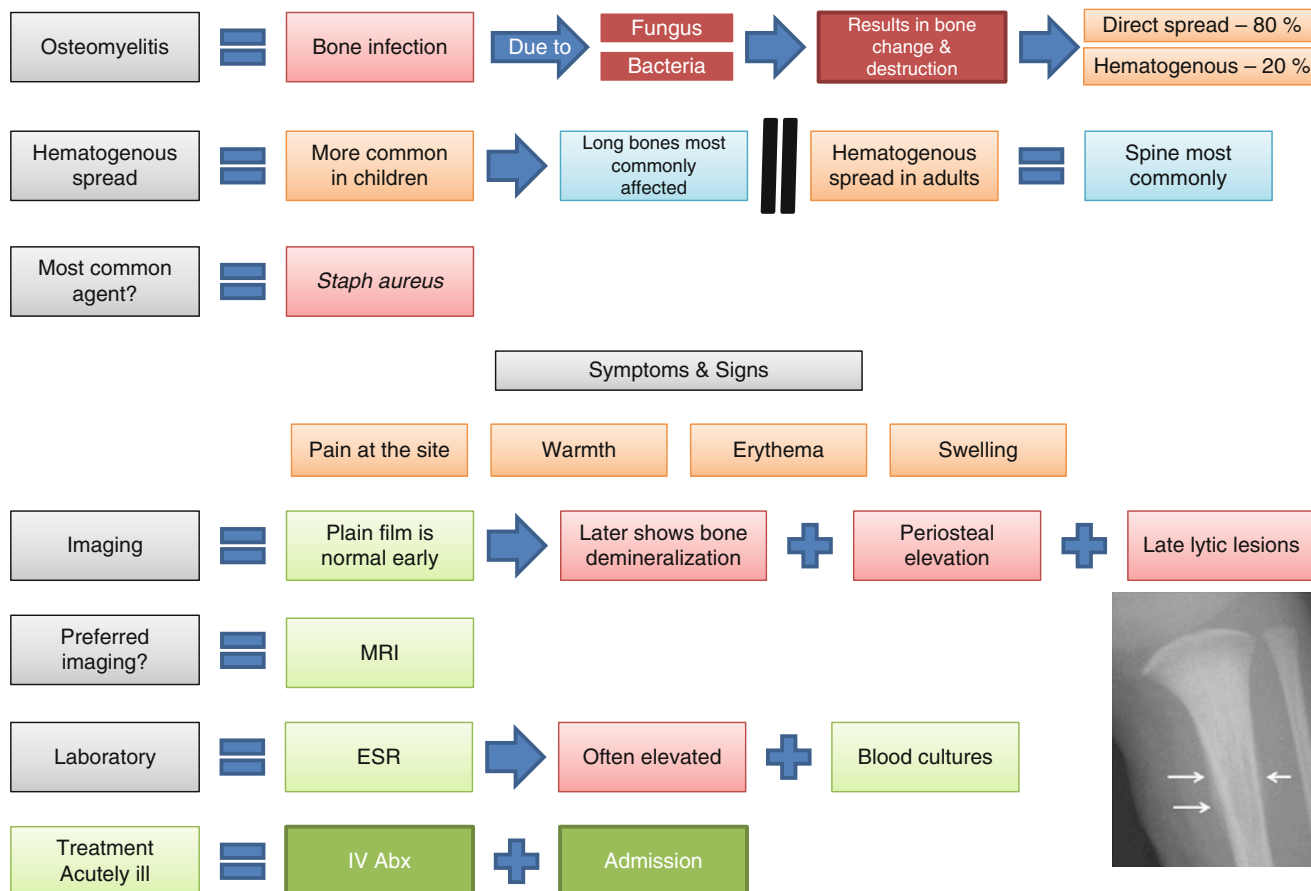
Metatarsal Fractures



Tarsal Tunnel Syndrome

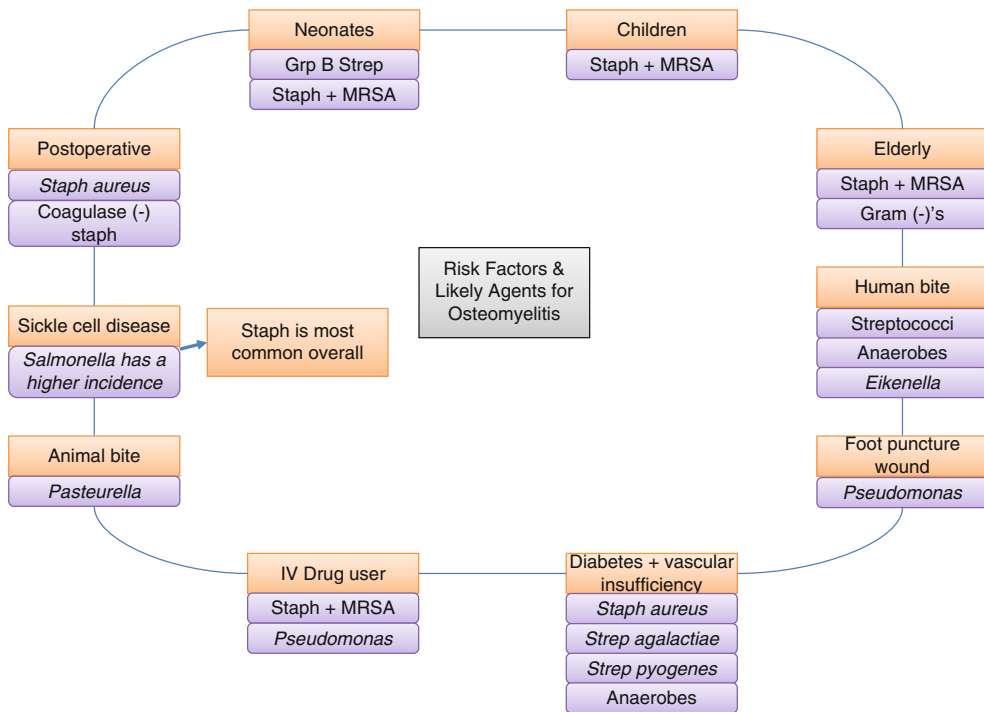


Osteomyelitis



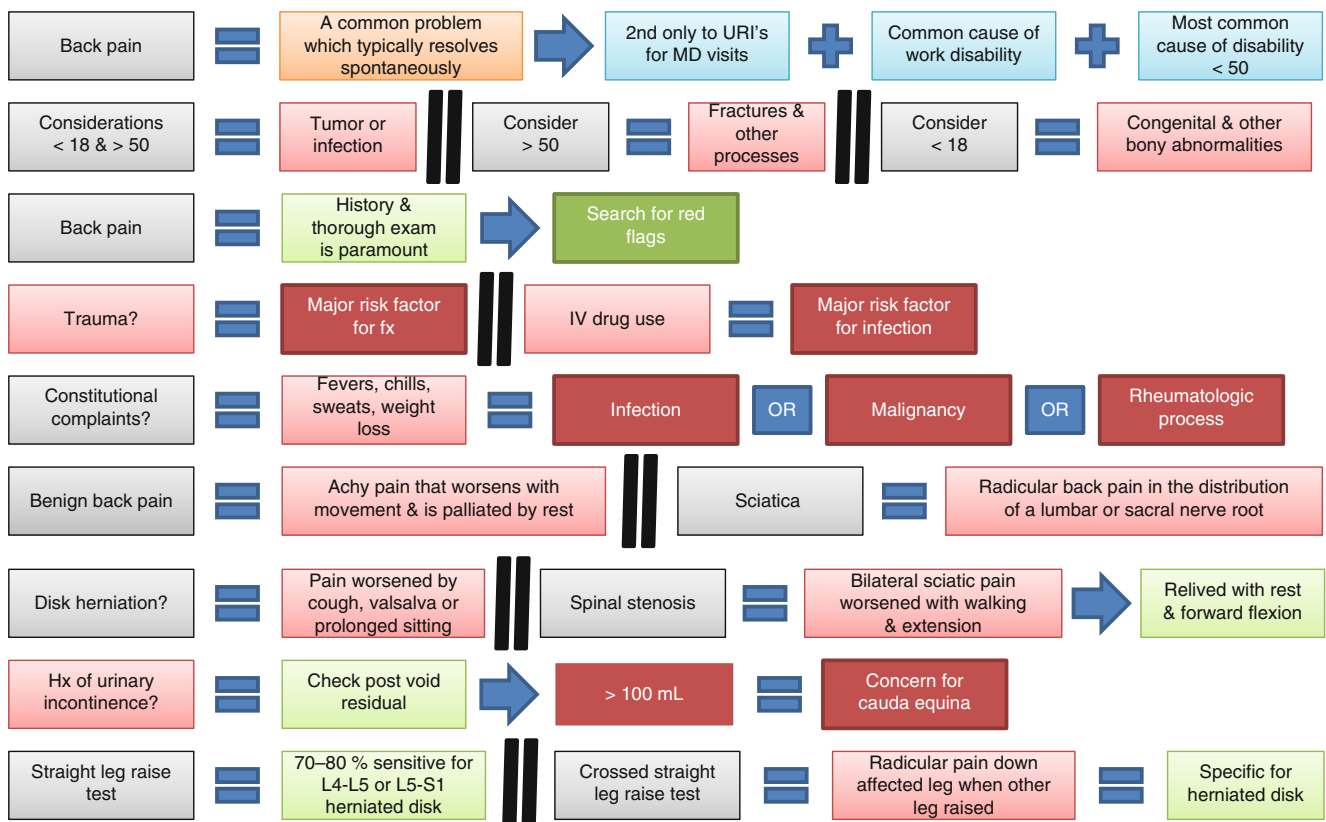
Bottom right image (Reprinted from Abdelgawad A, Naga O. Musculoskeletal infections. In: Abdelgawad A, Naga O, editors. Pediatric orthopedics: a handbook for primary care physicians. New York: Springer; 2014. p. 561–84. With permission from Springer Science + Business Media)

Risk Factors and Likely Agents for Osteomyelitis

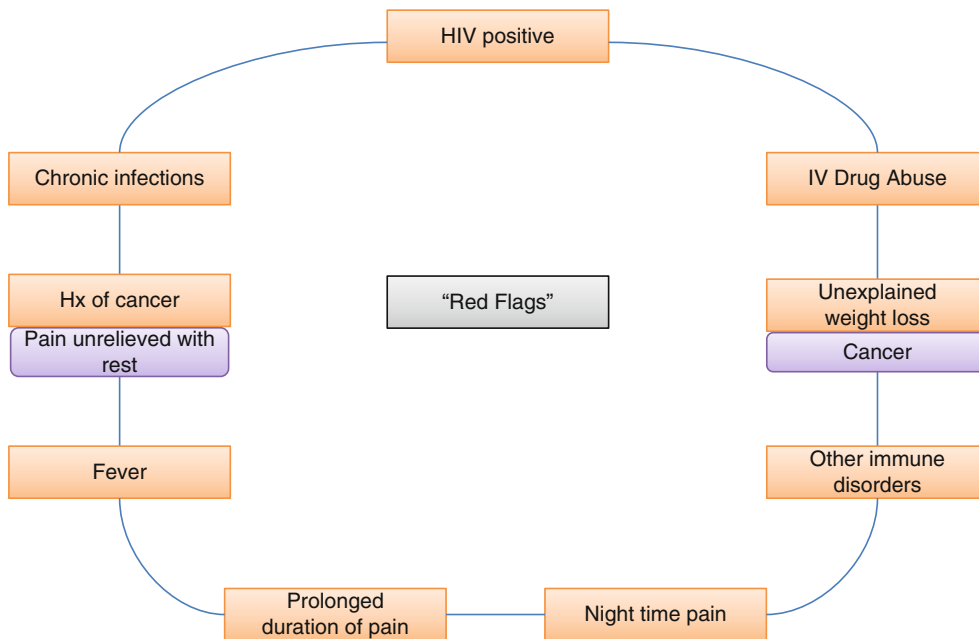


Thoracic and Lumbar Pain

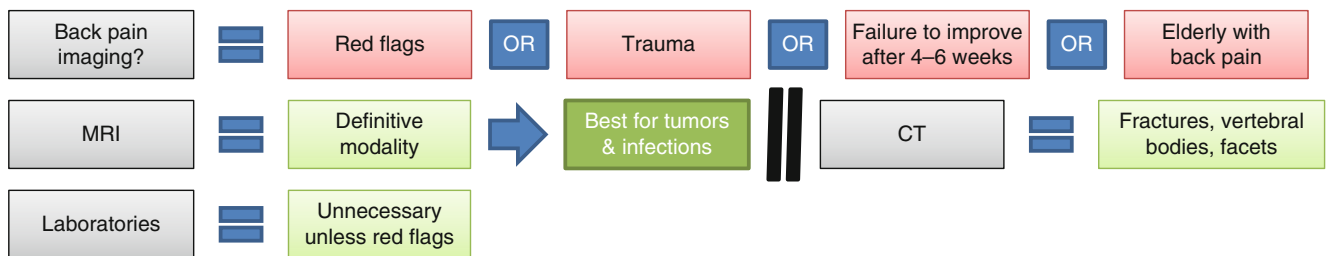
Back Pain Tidbits



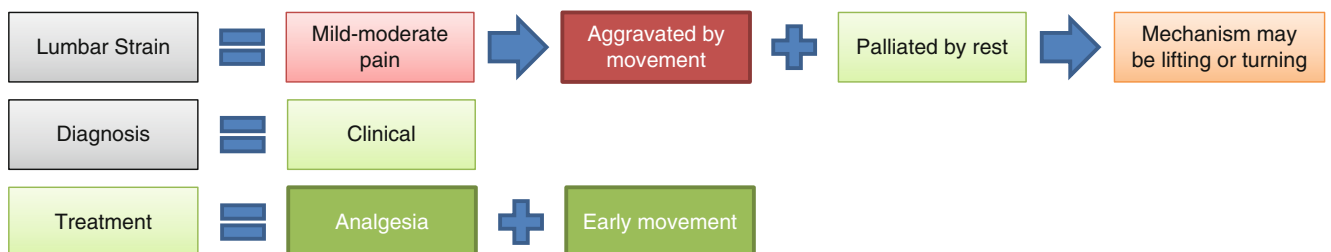
Red Flags



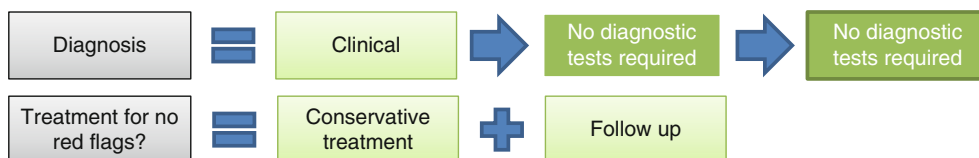
Back Pain Workup



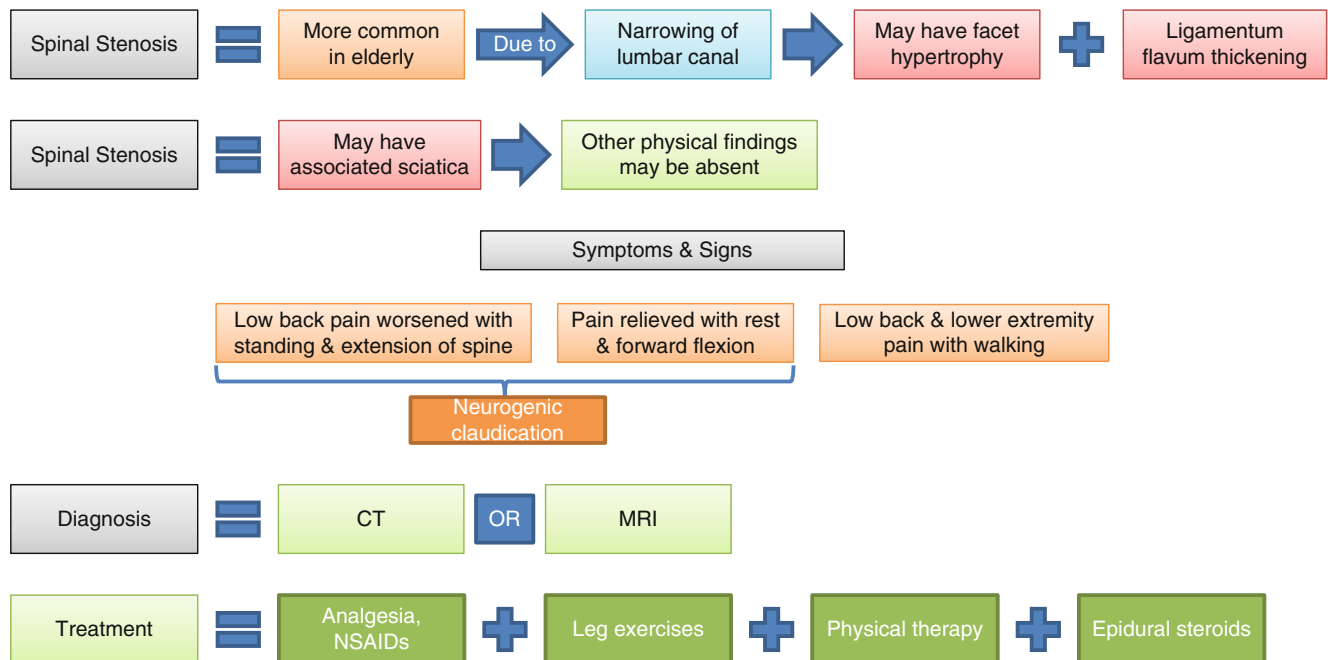
Lumbar Strain/Nonspecific Back pain



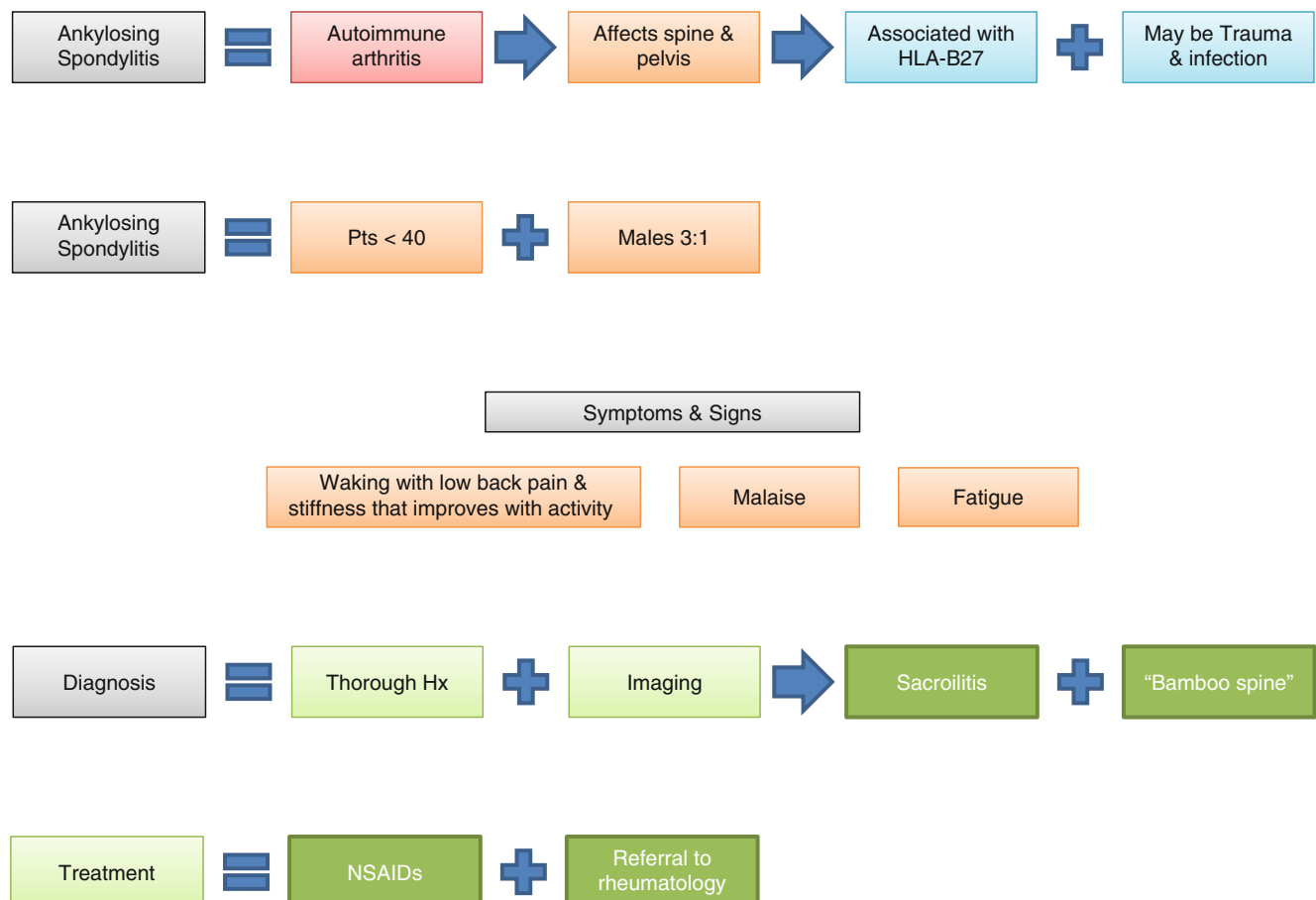
Disk Herniation



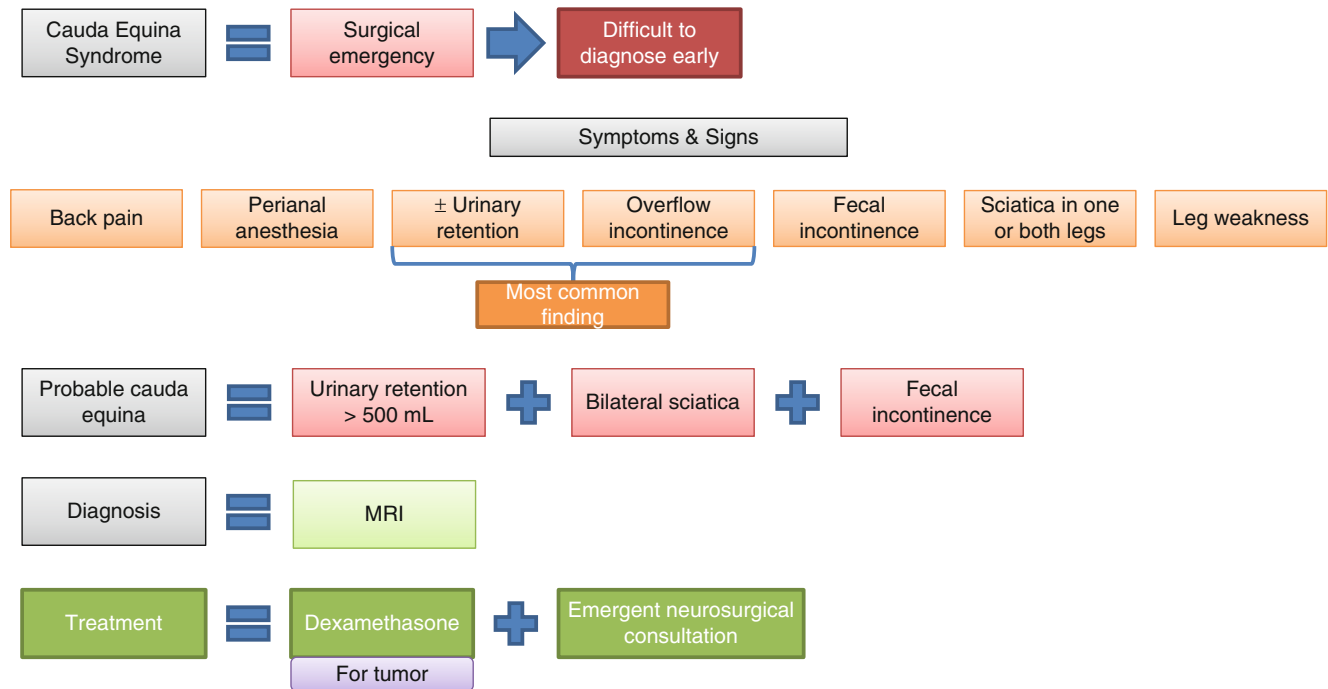
Spinal Stenosis



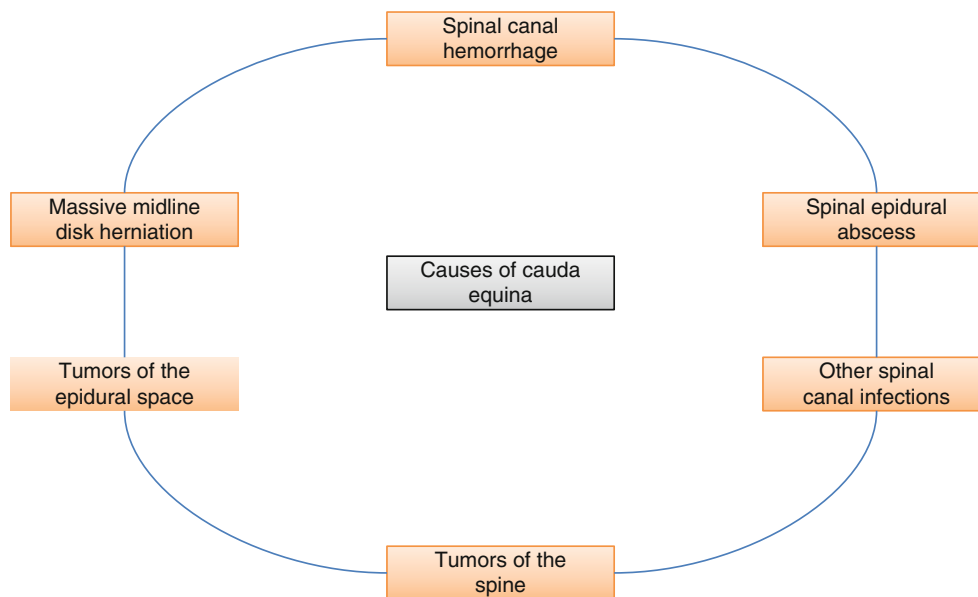
Ankylosing Spondylitis



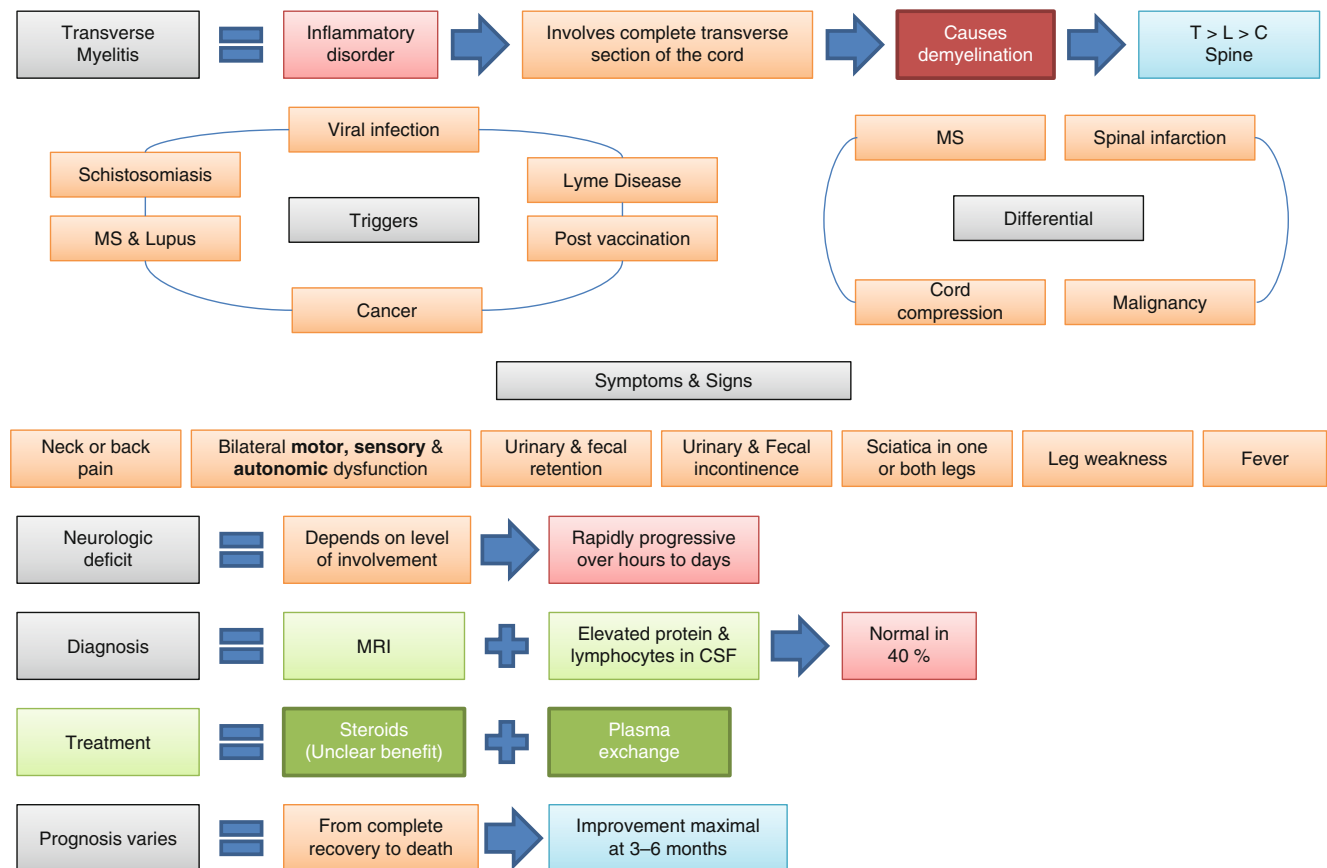
Cauda Equina Syndrome



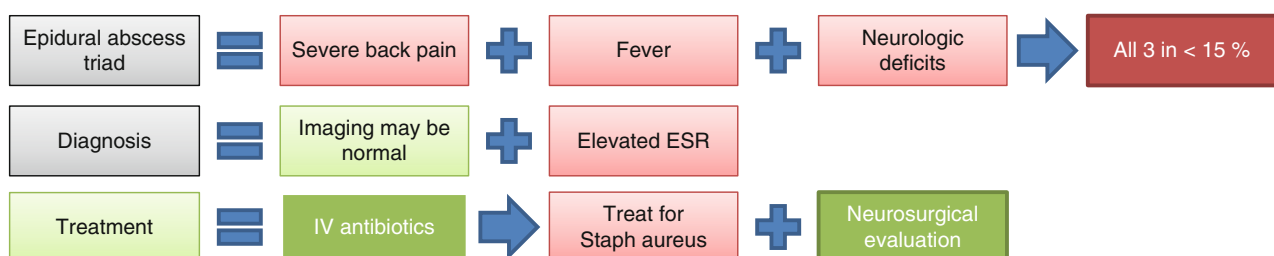
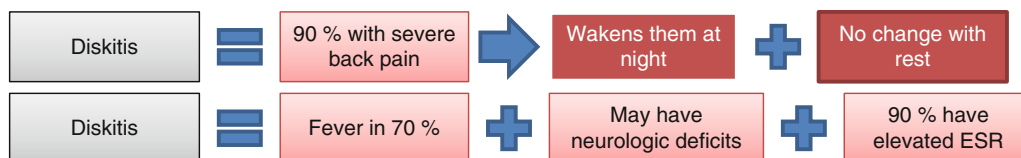
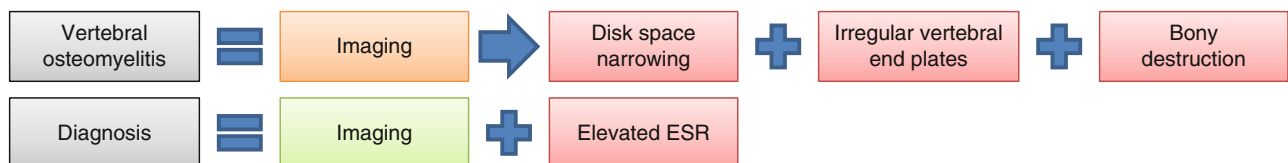
Causes of Cauda Equina



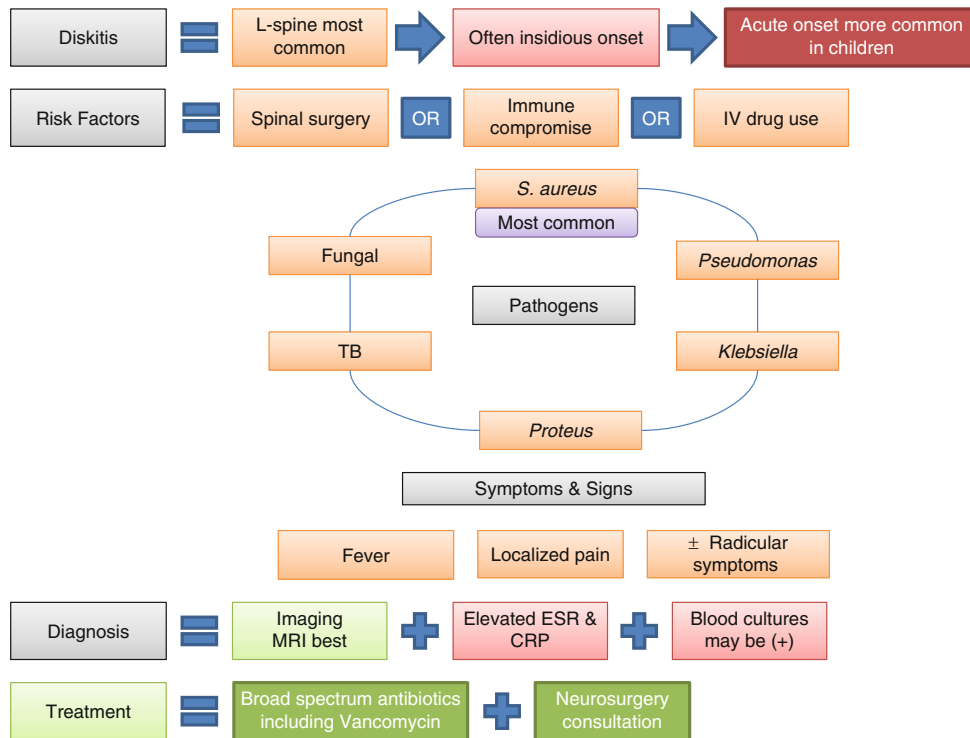
Transverse Myelitis



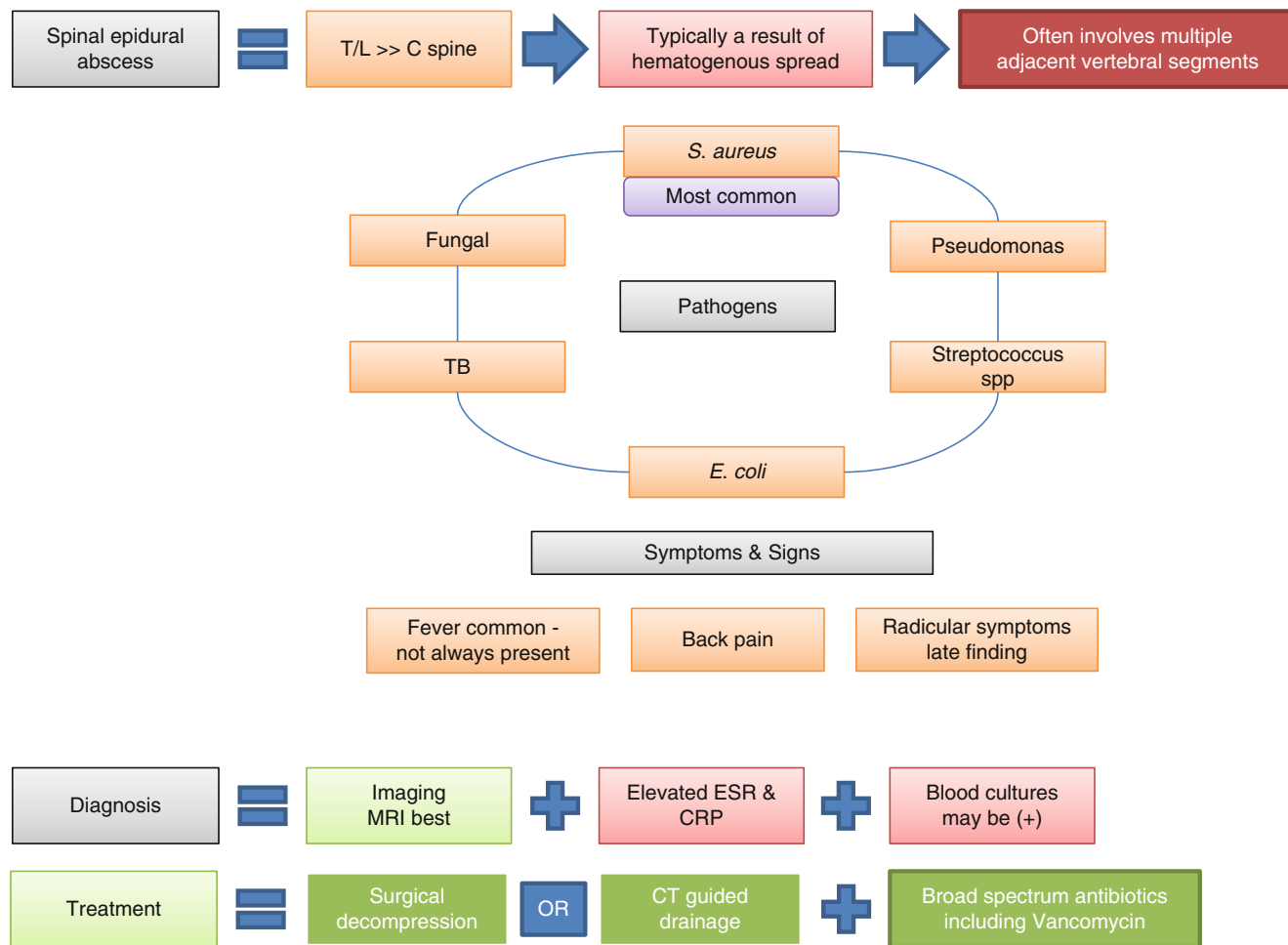
Spinal Infections



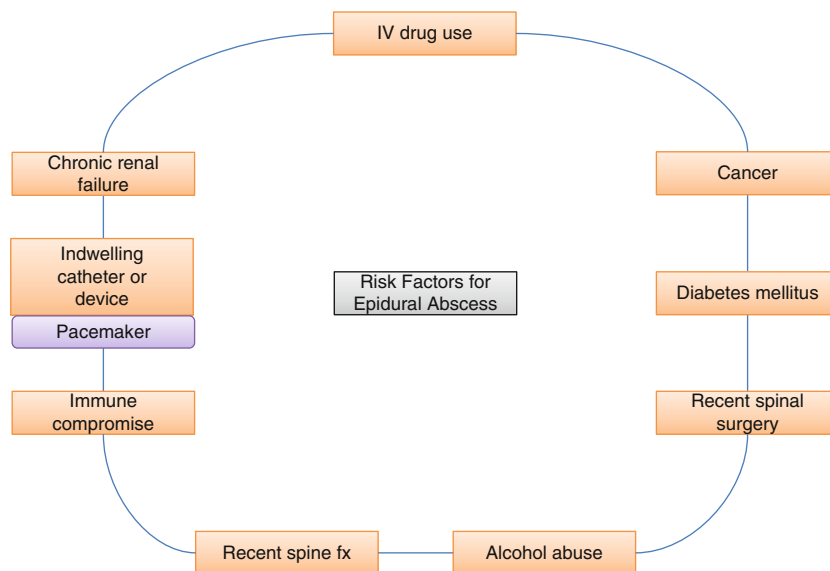
Diskitis



Spinal Epidural Abscess



Risk Factors for Epidural Abscess

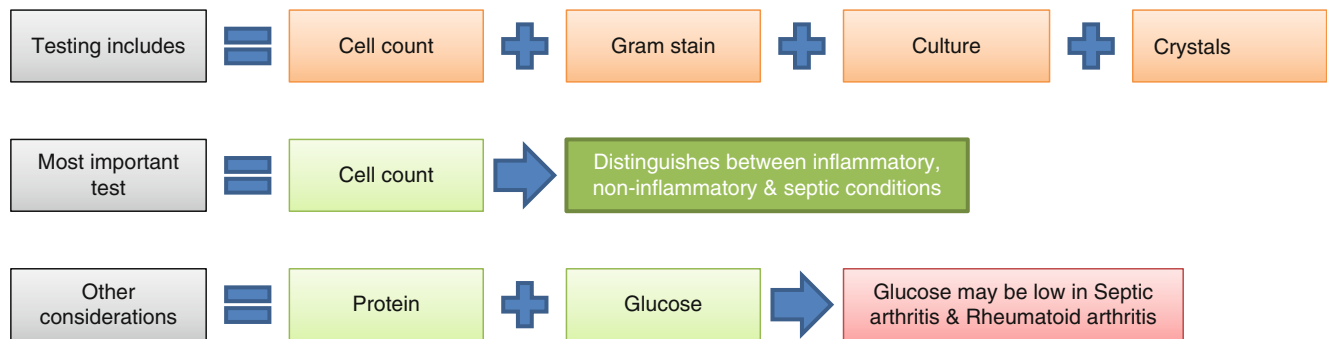


Rheumatologic Emergencies

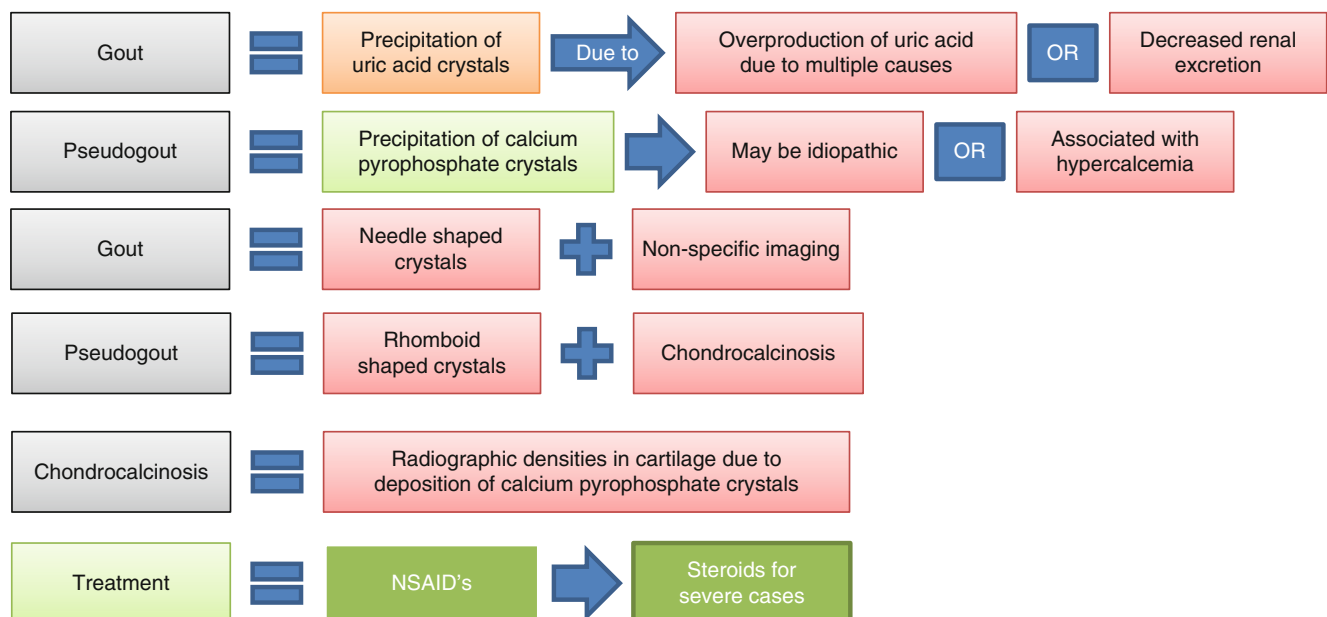
Joint Fluid Analysis

	Normal	Non-Inflammatory	Inflammatory	Septic
Clarity	Transparent	Transparent	Translucent to opaque	Opaque
Color	Clear	Yellow tinged	Yellow tinged	Yellow to green
WBC (per mm ³)	< 200	200–2000	2,000–50,000	>50,000
PMN's (%)	< 25	< 25	≥ 50	≥ 75
Culture	Negative	Negative	Negative	Often positive
Crystals	None	None	None or multiple	None
Conditions		Osteoarthritis	Gout, pseudogout, Lupus	Staph, GC

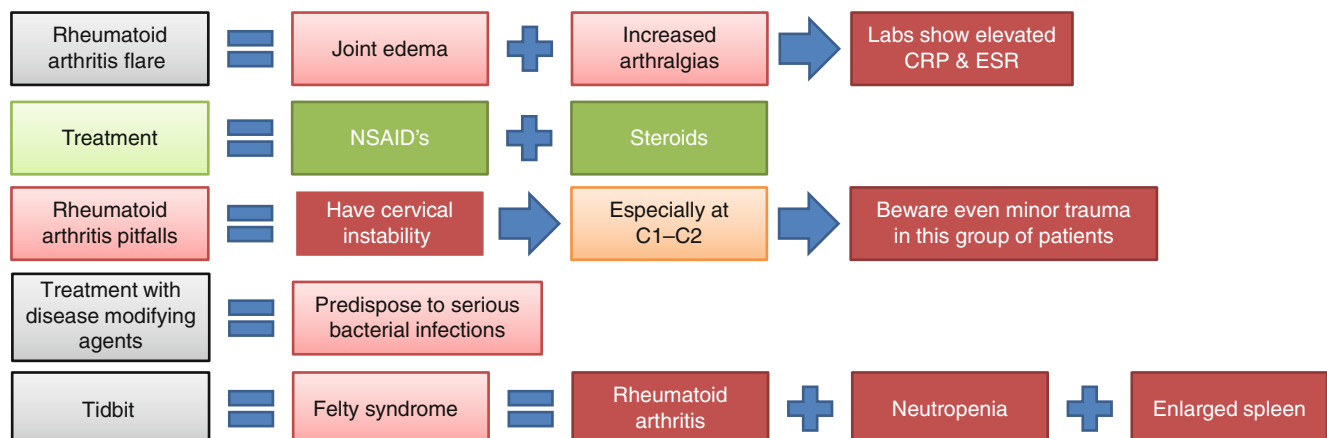
Joint Fluid Tidbits



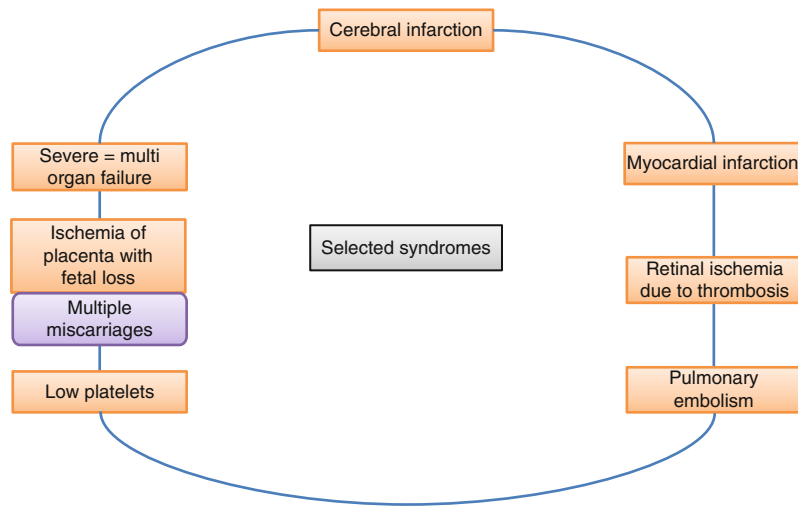
Gout and Pseudogout



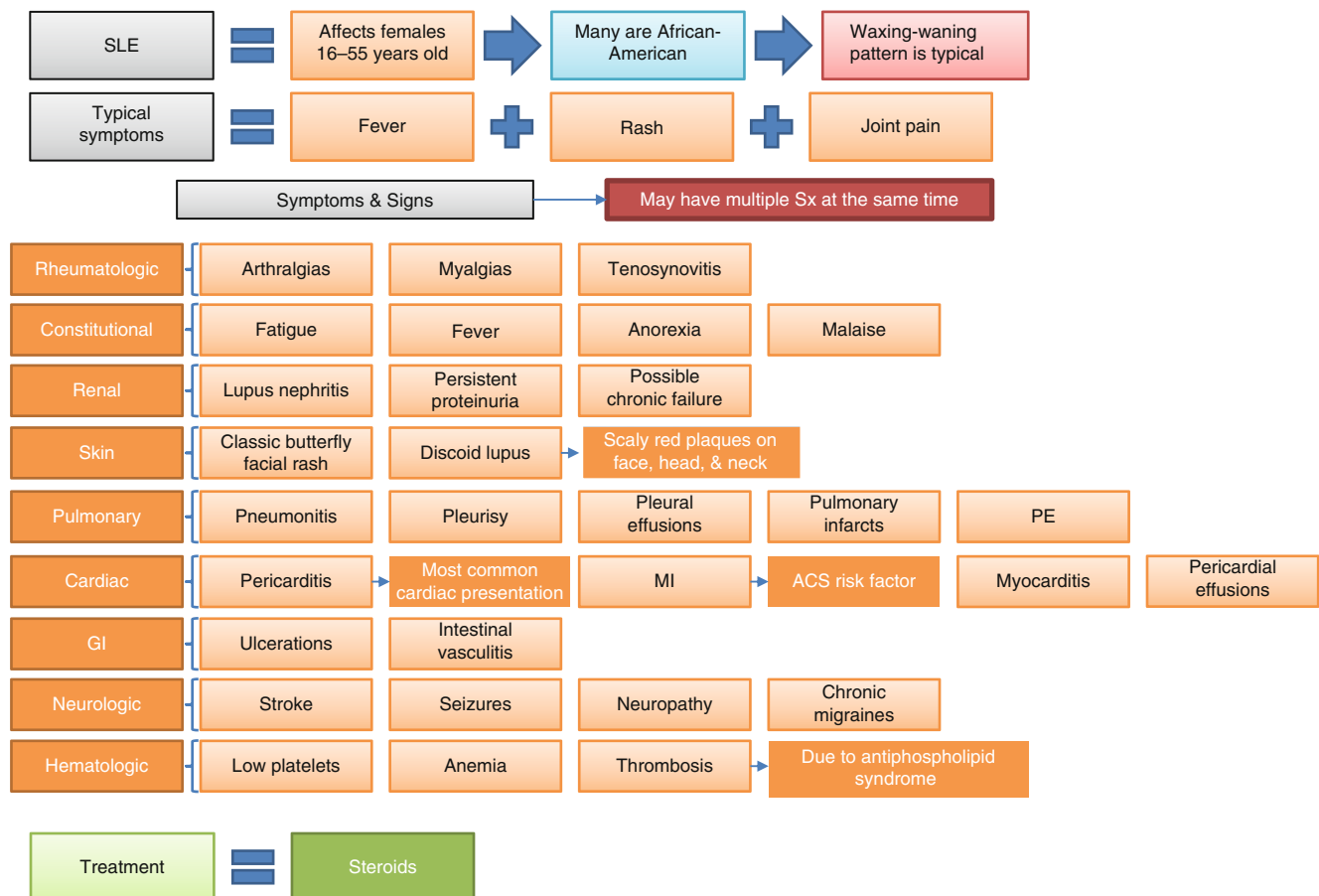
Rheumatoid Arthritis



Antiphospholipid Syndrome



Systemic Lupus Erythematosus (SLE) Tidbits



Trauma

Henry Young II and Bobby Desai

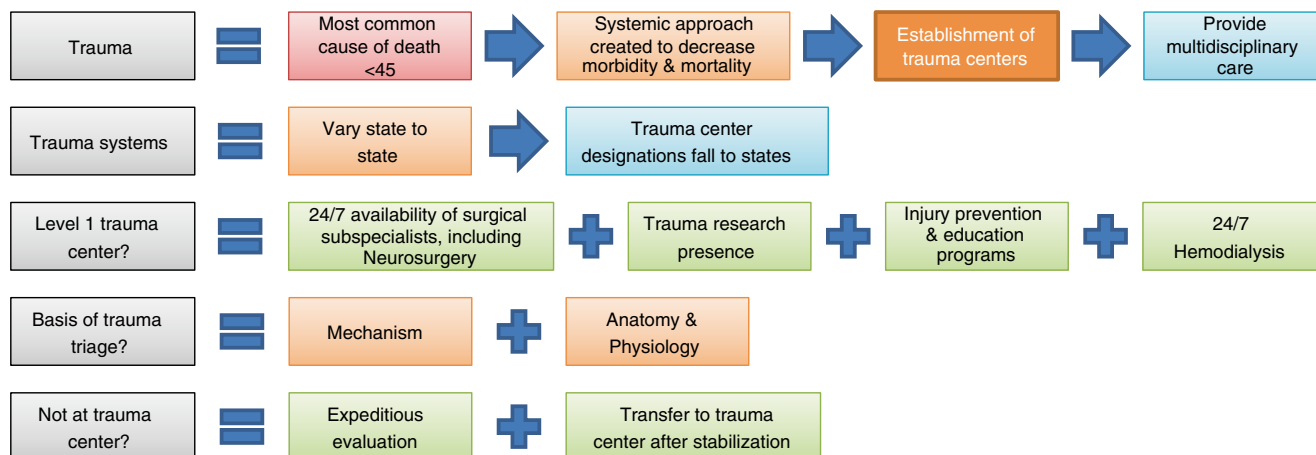
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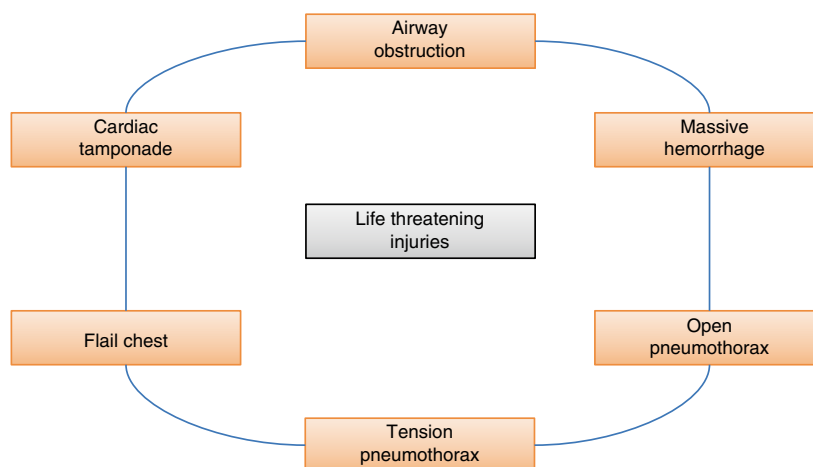
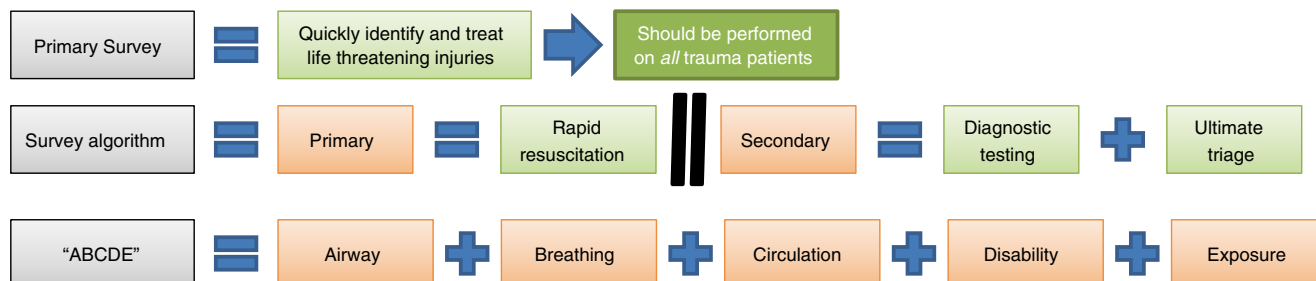
H. Young II, MD
Department of Emergency Medicine, UF Health at the University
of Florida, Gainesville, FL, USA

B. Desai, MD, MEd (✉)
Department of Emergency Medicine, University of Florida,
Gainesville, FL, USA
e-mail: bdesai@ufl.edu

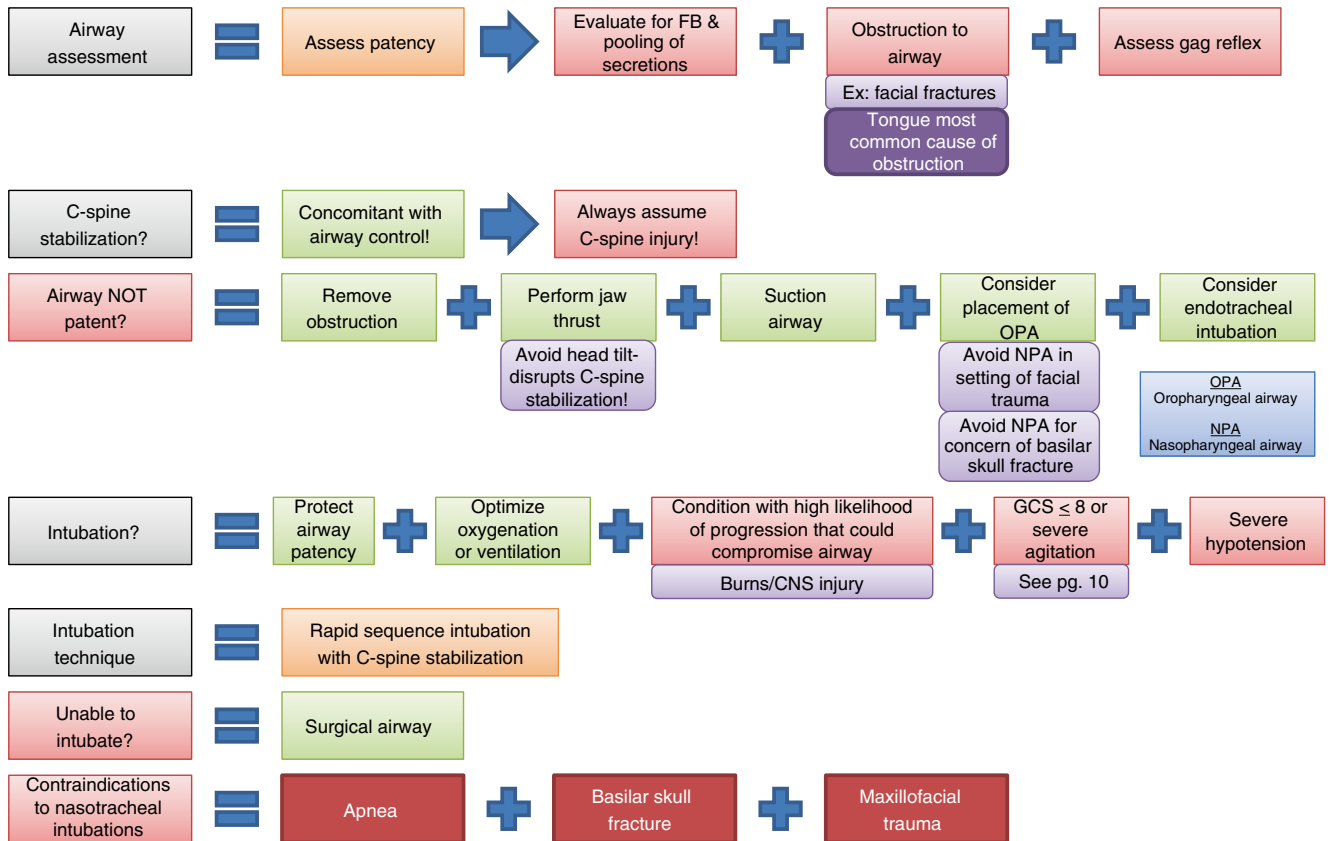
Introduction



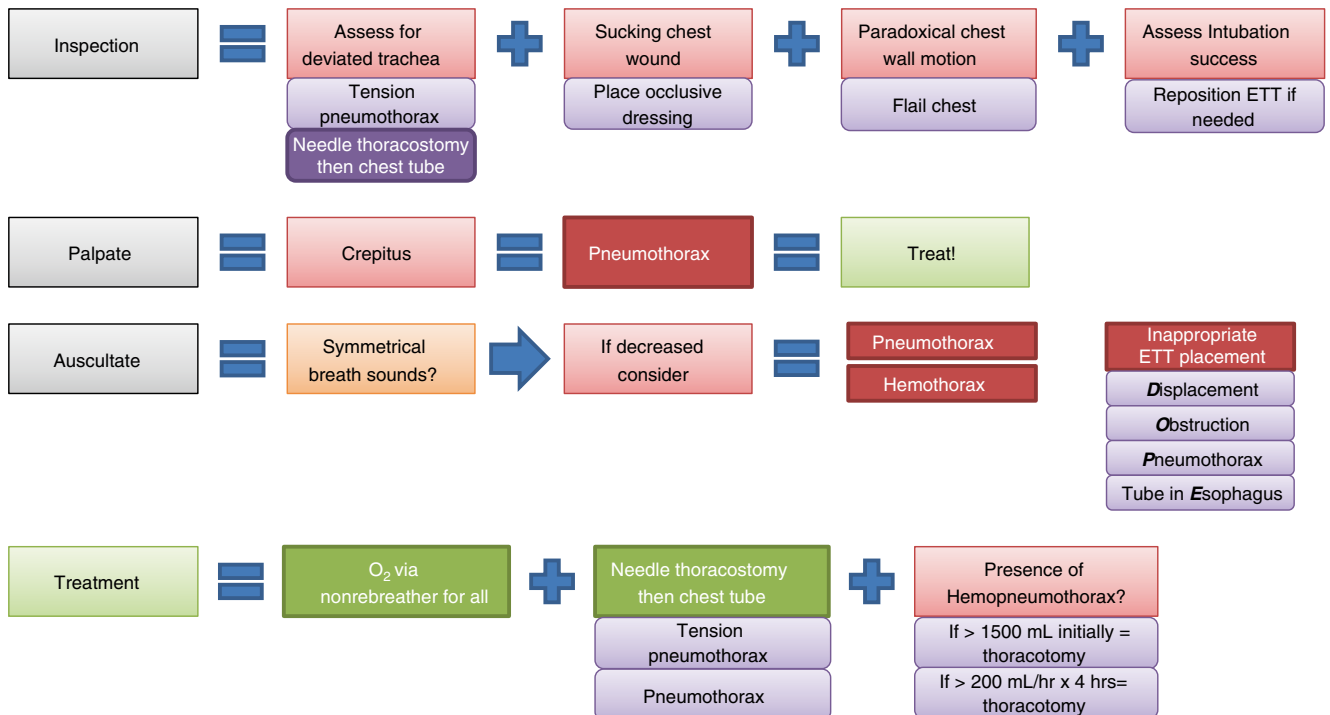
Primary Survey



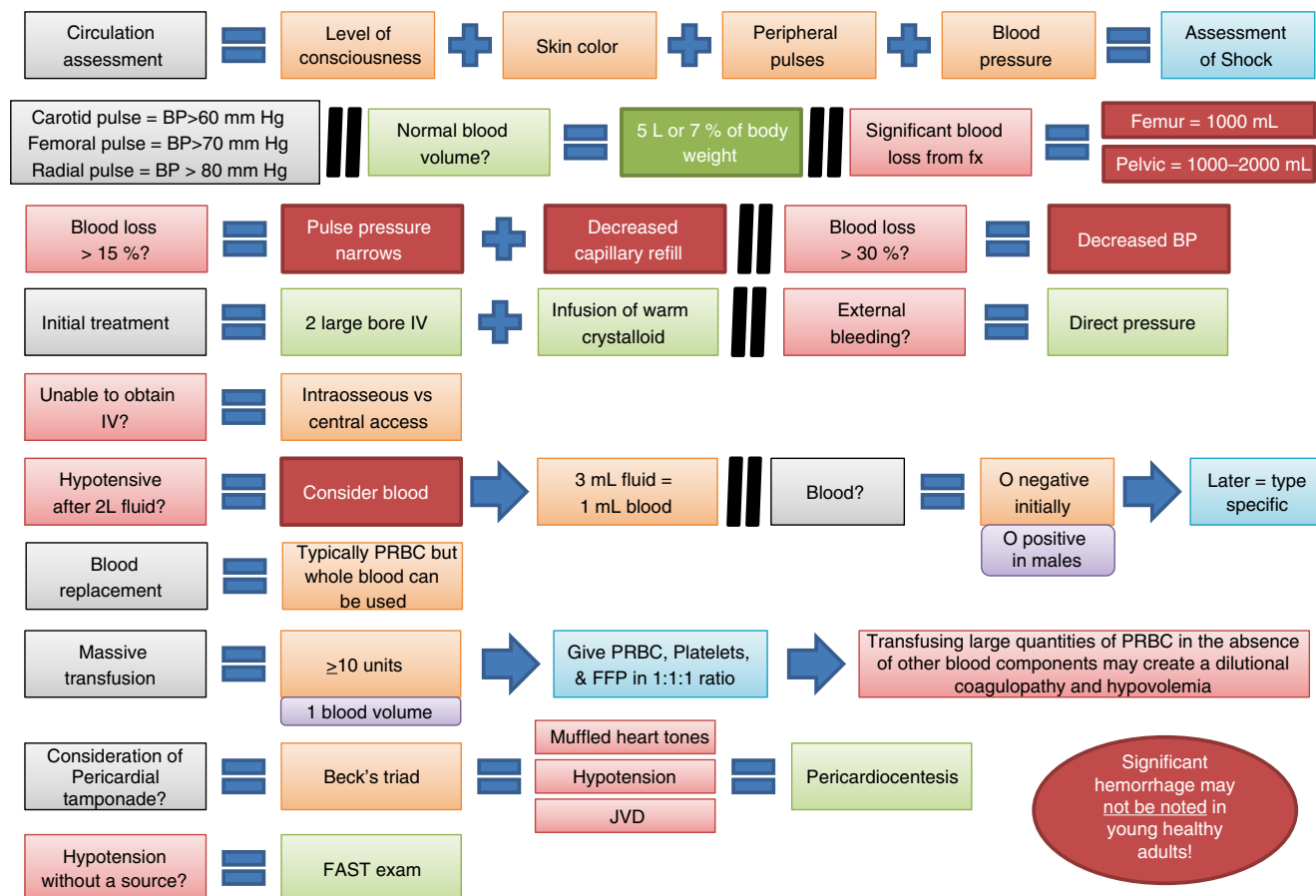
Airway Assessment



Breathing Assessment



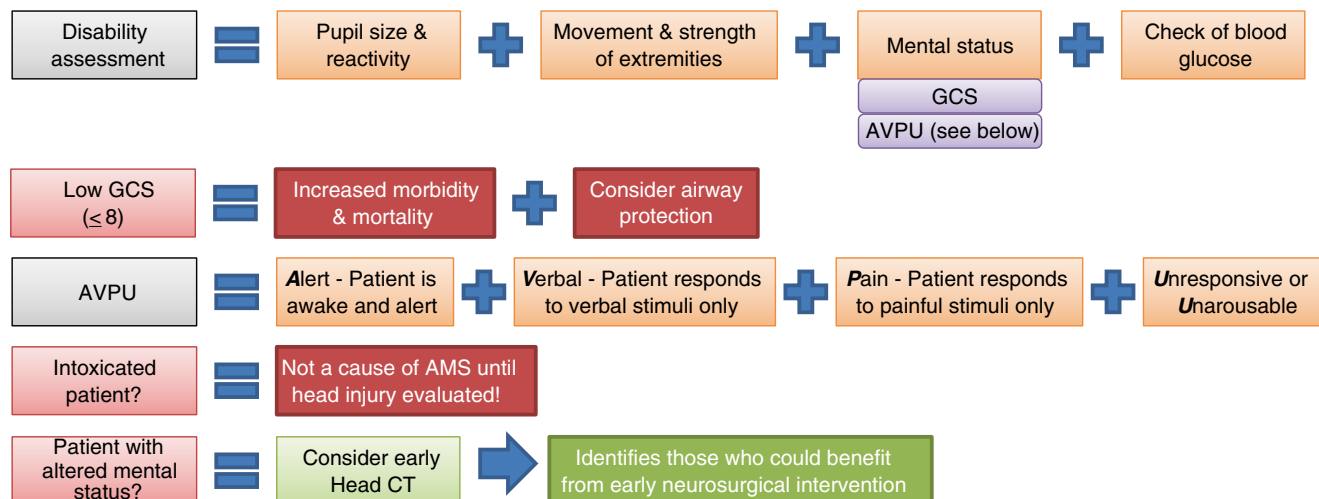
Circulation Assessment



Classification of Hemorrhage

	Blood loss	Cardiovascular	Neurologic	Skin	Renal
Class I	< 15 % < 750 ml	HR normal or slightly increased; BP normal	Normal or slightly anxious	Warm, pink, normal capillary refill	Normal output
Class II	15–30 % 750-1500ml	Tachycardia , BP normal	irritable, confused, combative	Cool, mottling, delayed capillary refill	Oliguria, increased spec. gravity
Class III	30–40 % 1500-2000ml	Significant tachycardia , thready pulse, hypotension , metabolic acidosis	Lethargic, diminished pain response	Cool, mottling, pallor, prolonged capillary refill	Oliguria, elevated BUN
Class IV	>40 % >2000ml	Severe tachycardia & hypotension, thready central pulse	Lethargic, coma	Cold extremities, pallor, cyanosis	Anuria

Disability Assessment

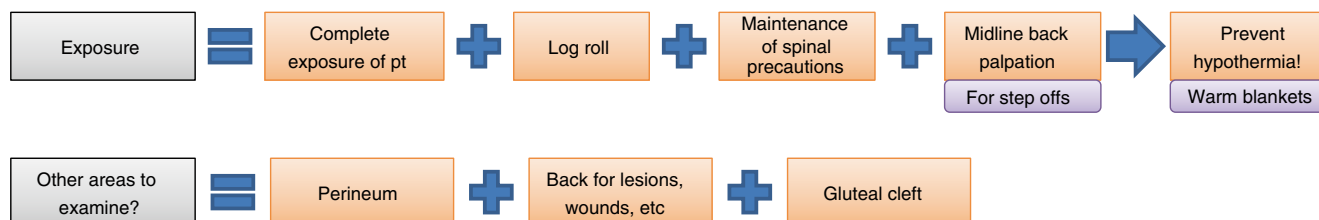


GCS

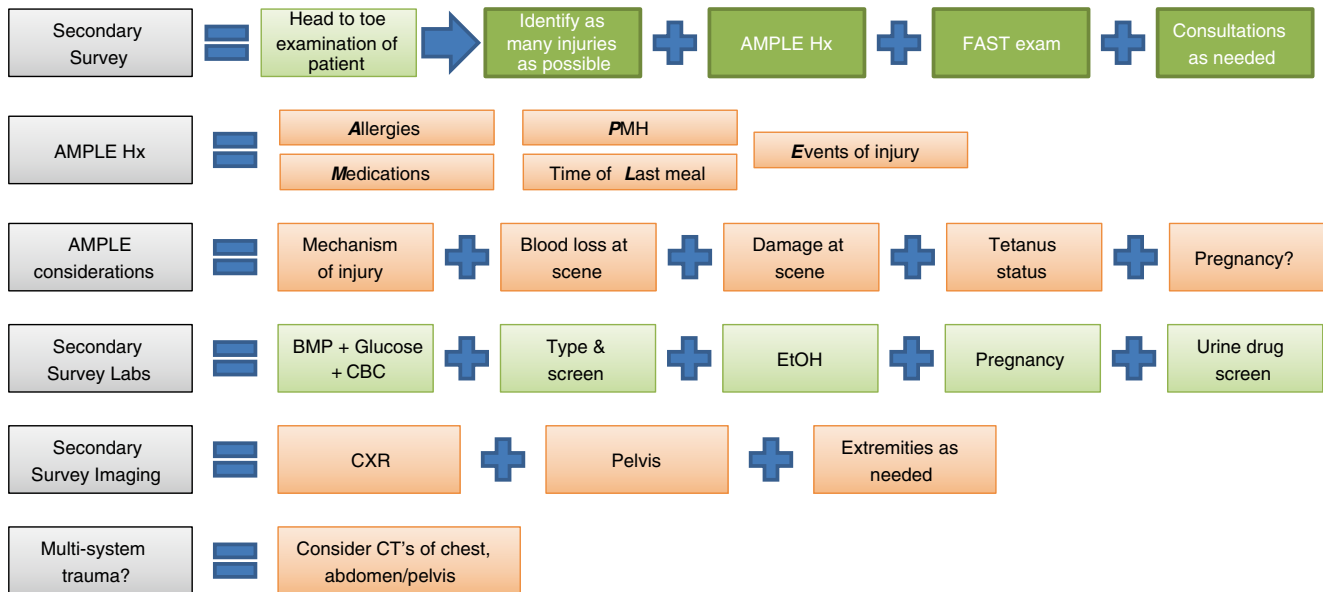
Eye opening	Best verbal	Best motor
4-Spontaneous	5-Oriented/converses	6-Obeys
3-Verbal command	4-Disoriented/converses	5-Localizes pain
2-Pain	3-Inappropriate words	4-Withdraw to stim
1-No response	2-Incomprehensible	3-Abn ext/decer
	1-No response	2-Abn ext/decer
		1-No response

Center bottom image (Reprinted from Allen B, Ganti L, Desai B. Trauma and ATLS. In: Allen B, Ganti L, Desai B, editors. Quick hits in emergency medicine. New York: Springer Science; 2013. p. 37–45. With permission from Springer Science + Business Media)

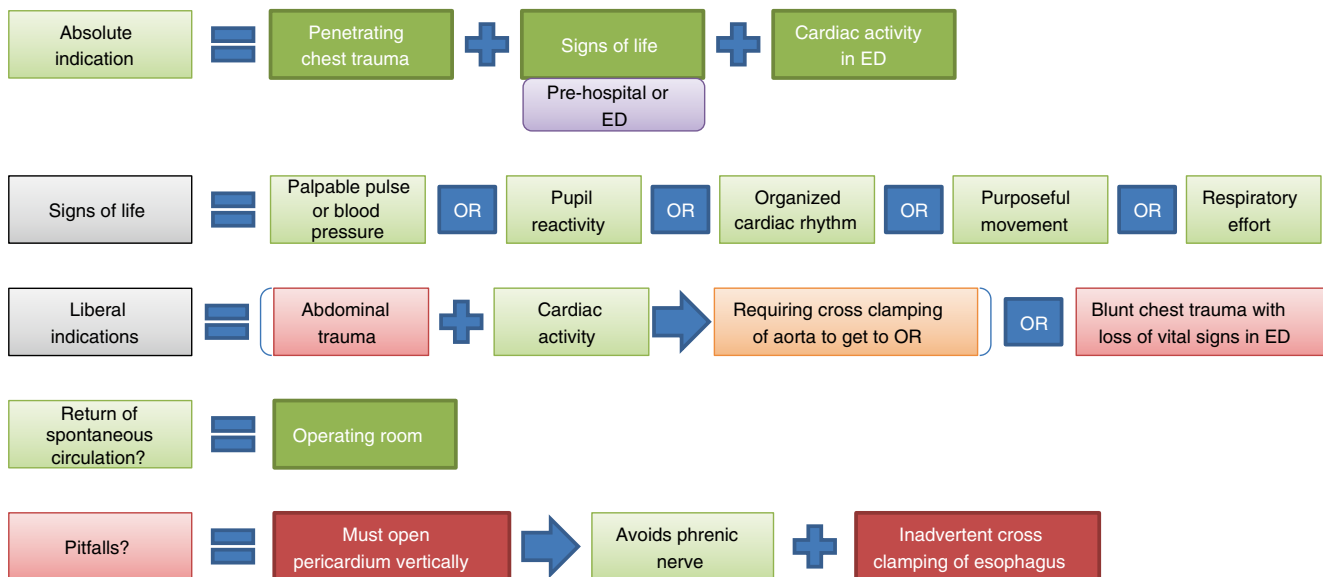
Exposure



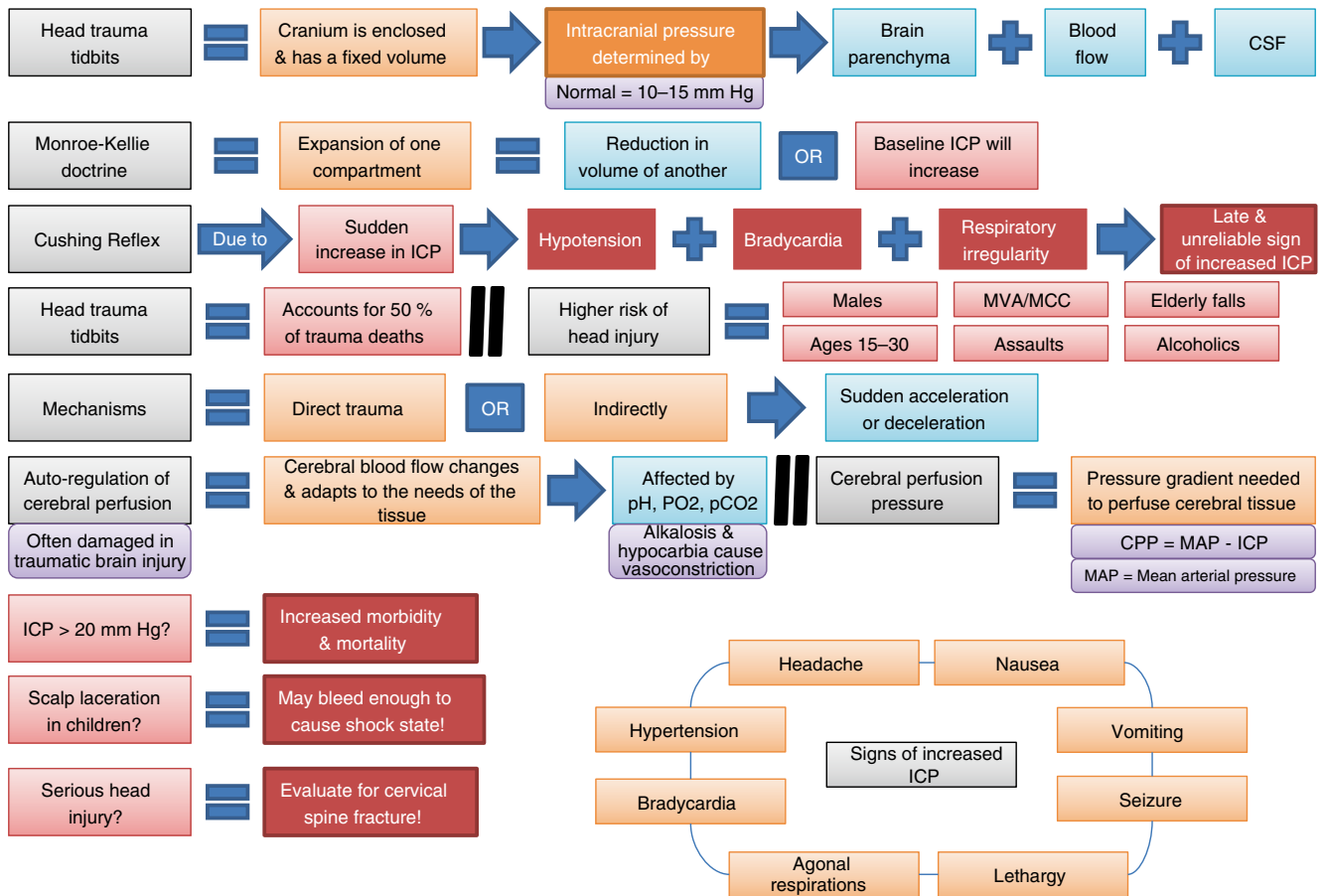
Secondary Survey



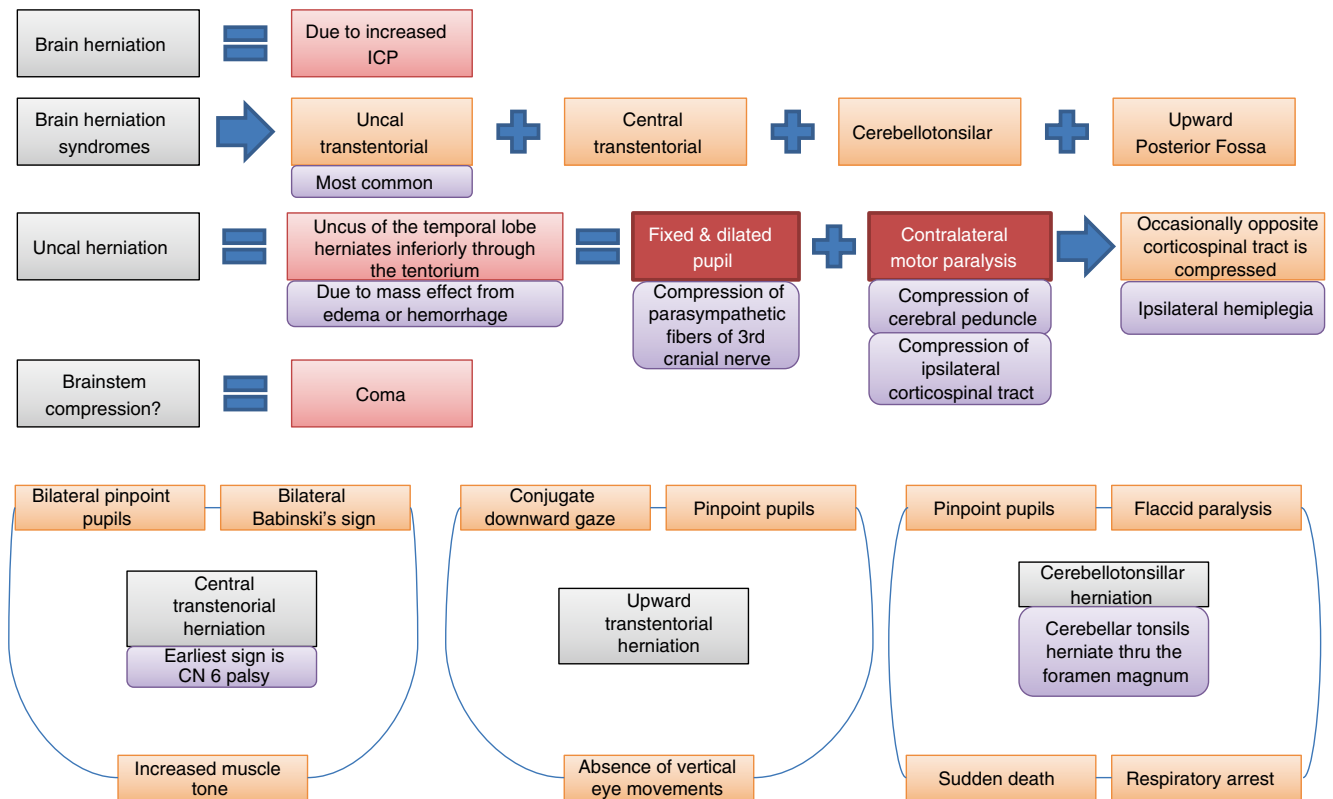
Traumatic Arrest and ED Thoracotomy



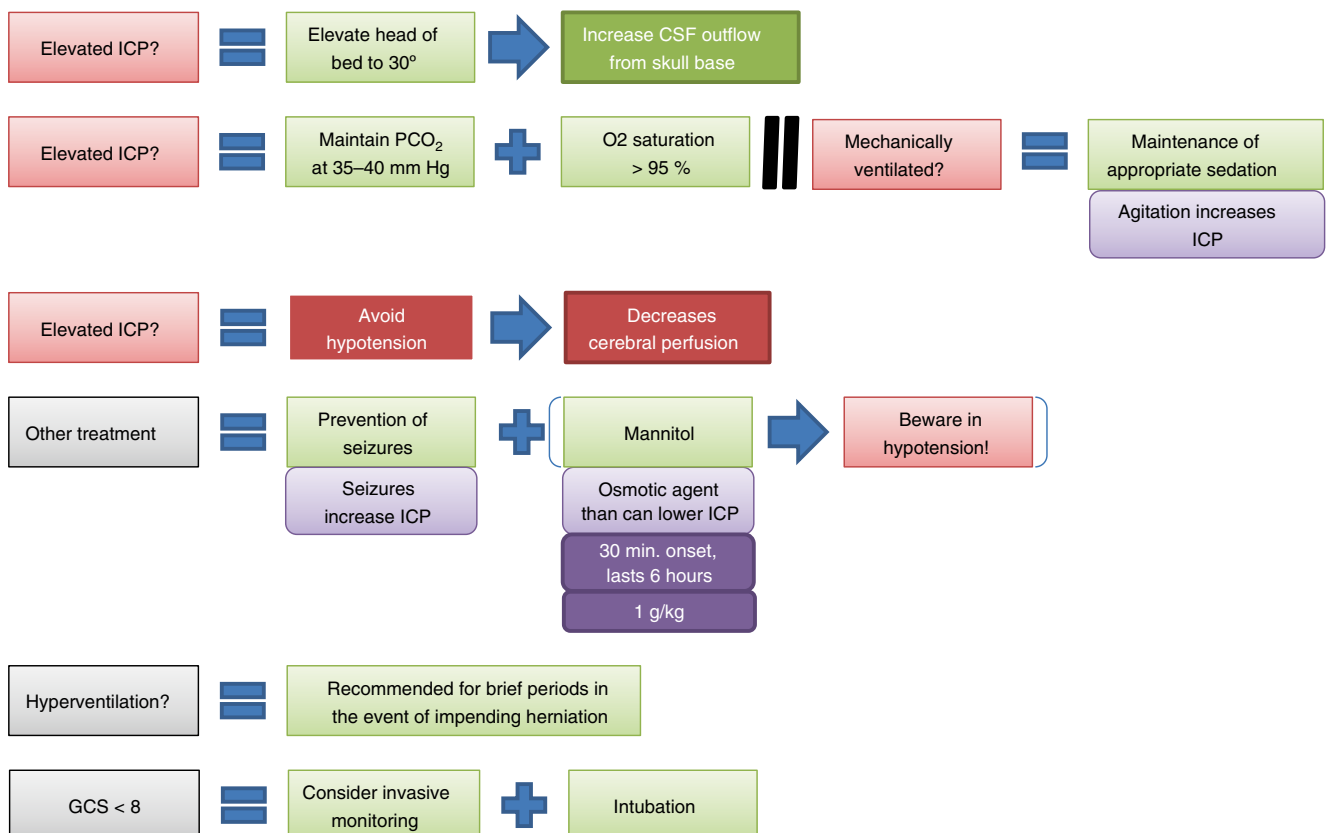
Head Trauma Introduction



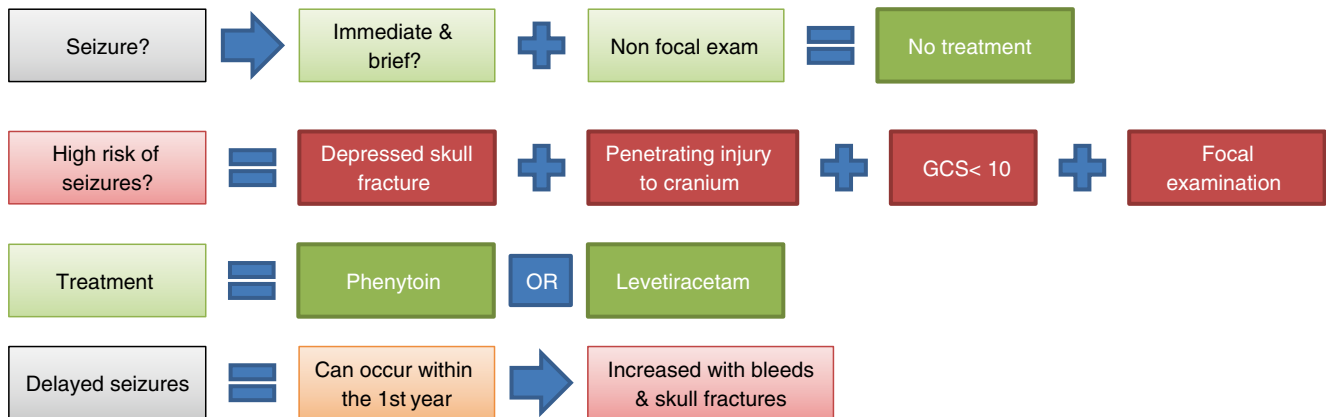
Brain Herniation



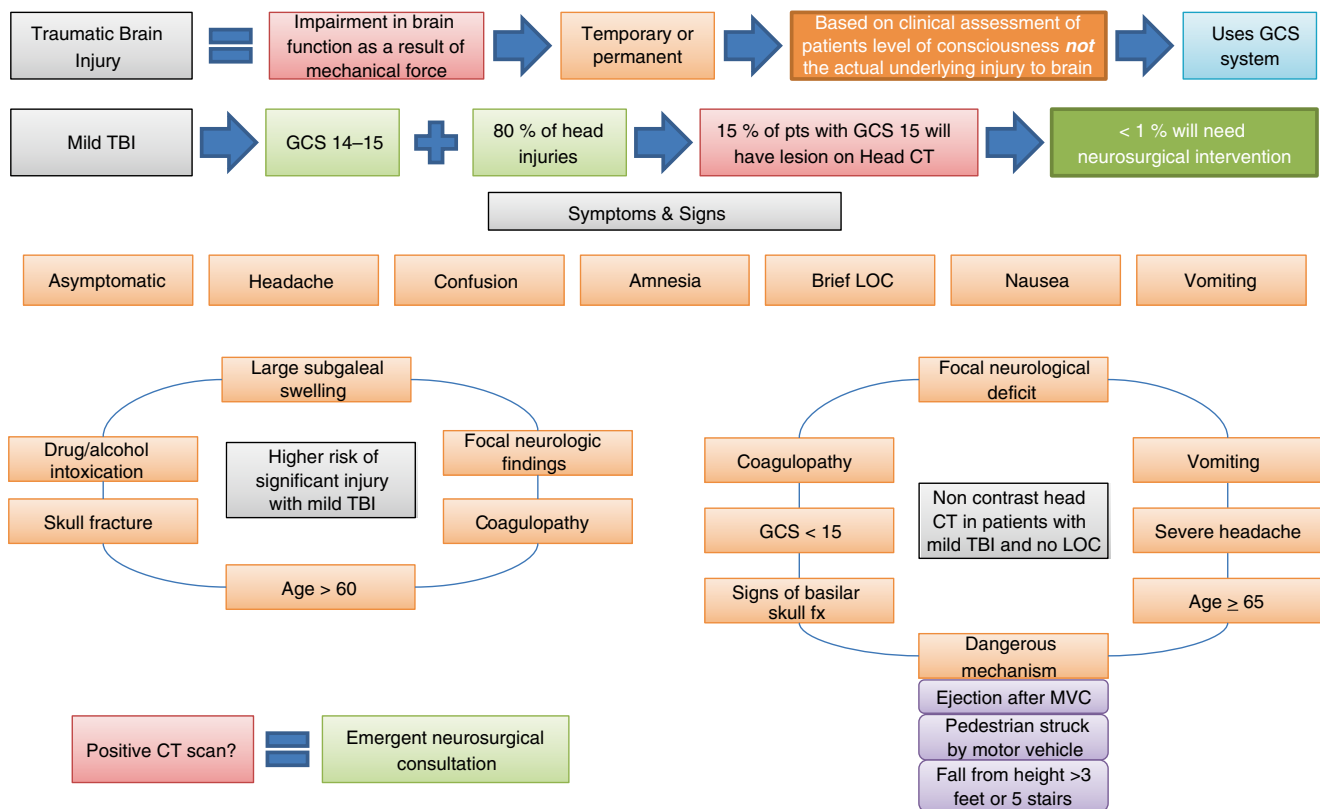
Treatment of Elevated ICP



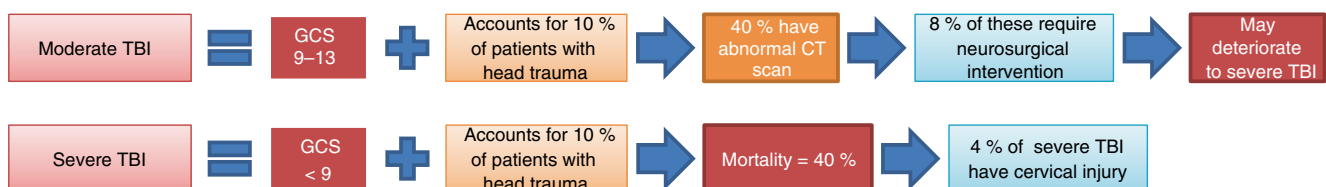
Traumatic Seizures



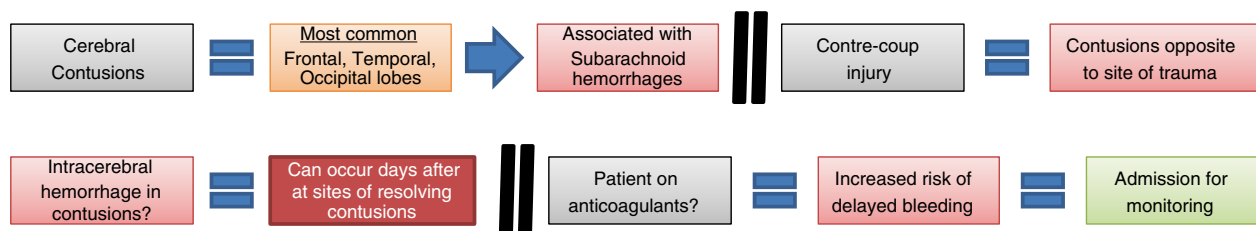
Mild Traumatic Brain Injury (TBI)



Moderate and Severe TBI



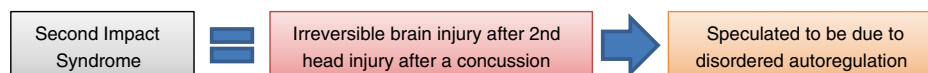
Cerebral Contusions



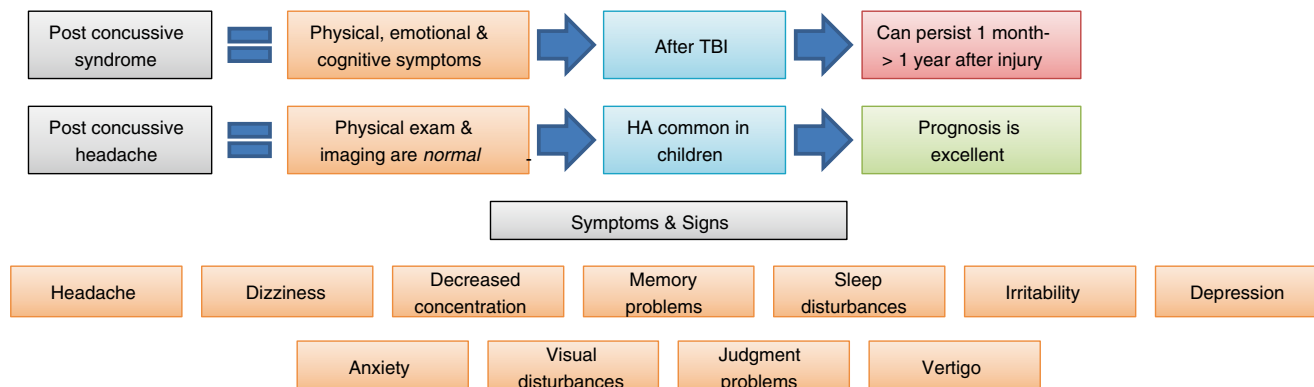
Concussion



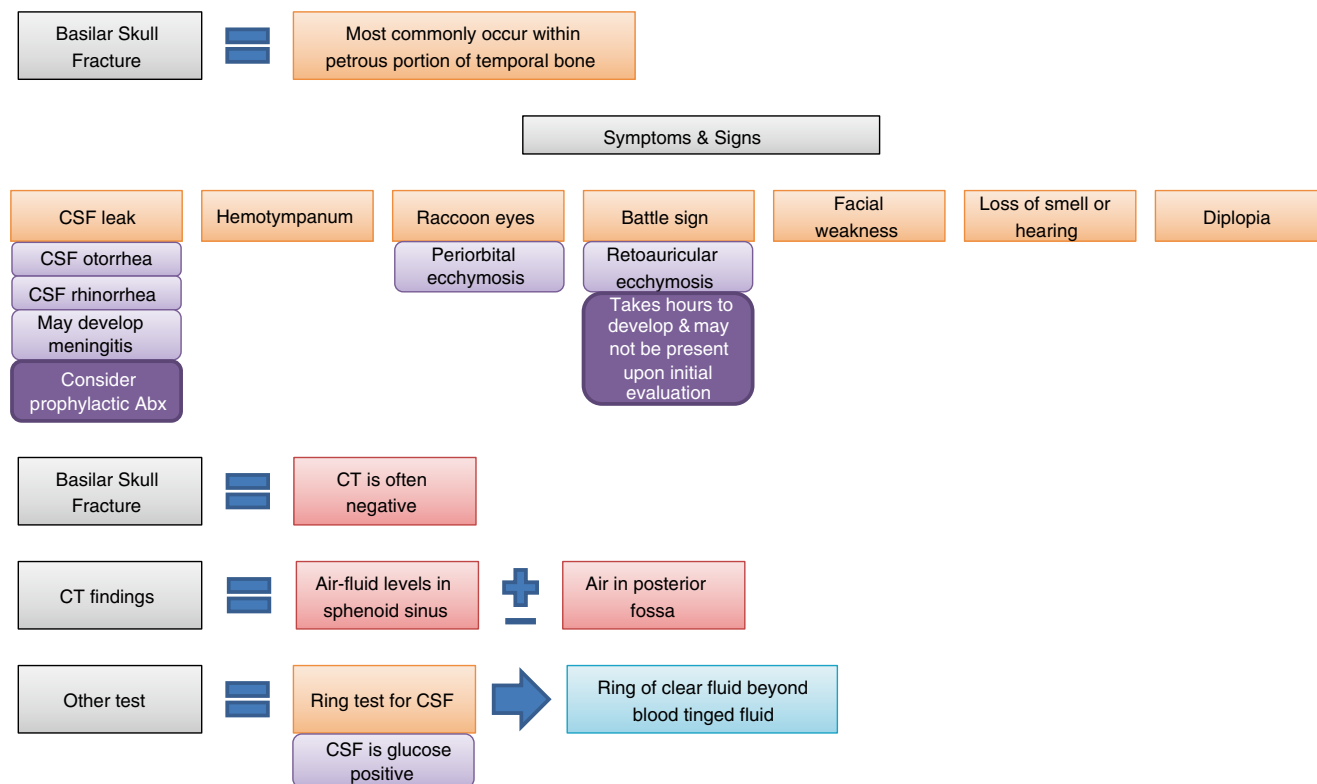
Second Impact Syndrome



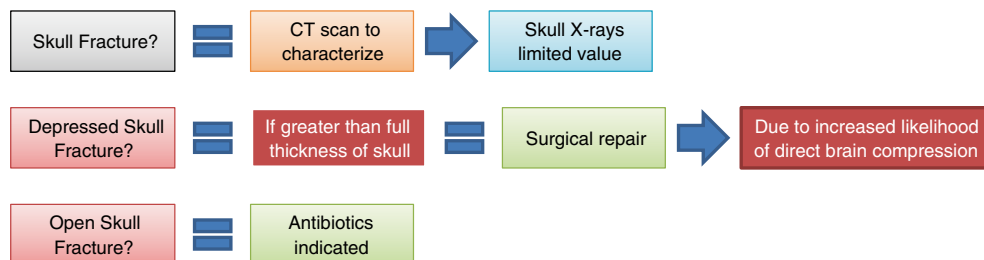
Postconcussive Syndrome



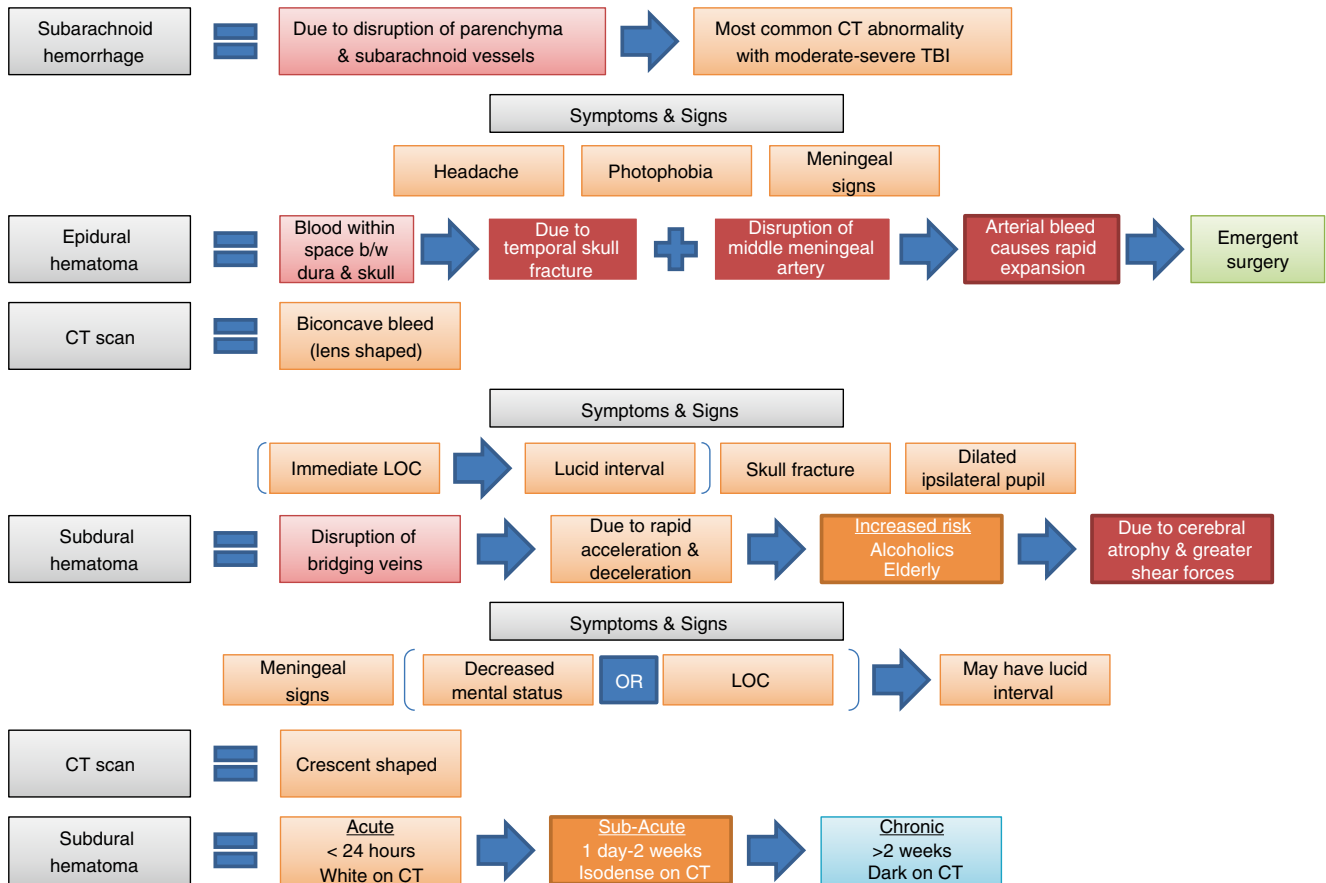
Basilar Skull Fracture



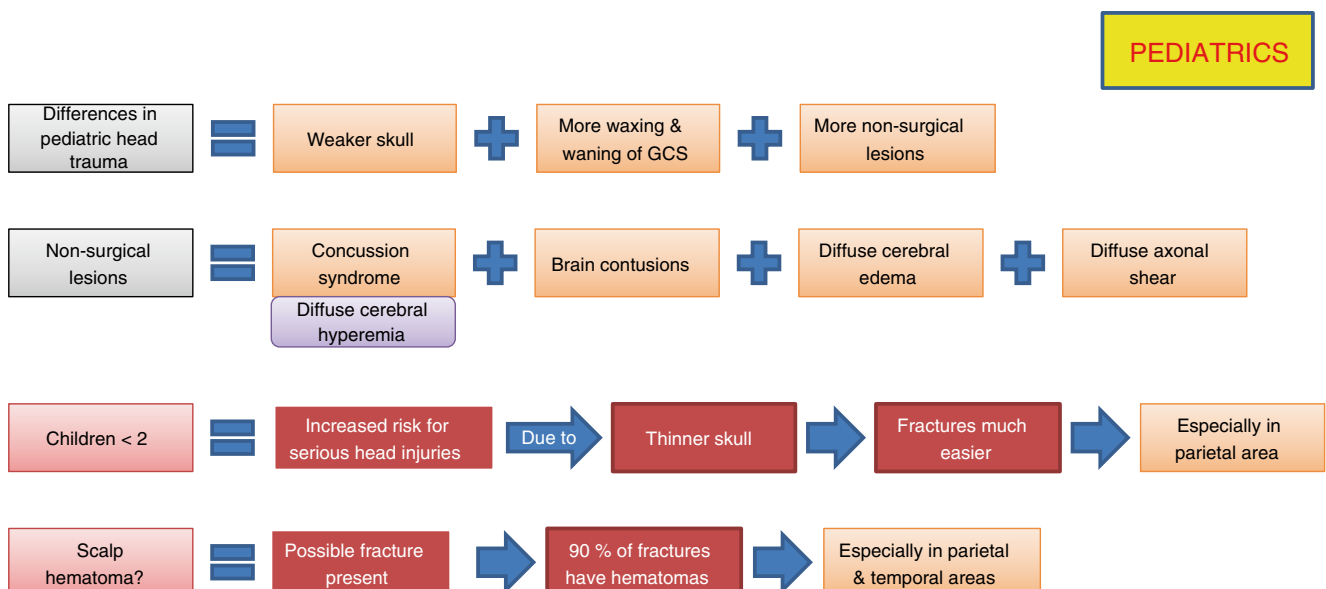
Skull Fracture



Intracranial Hemorrhage

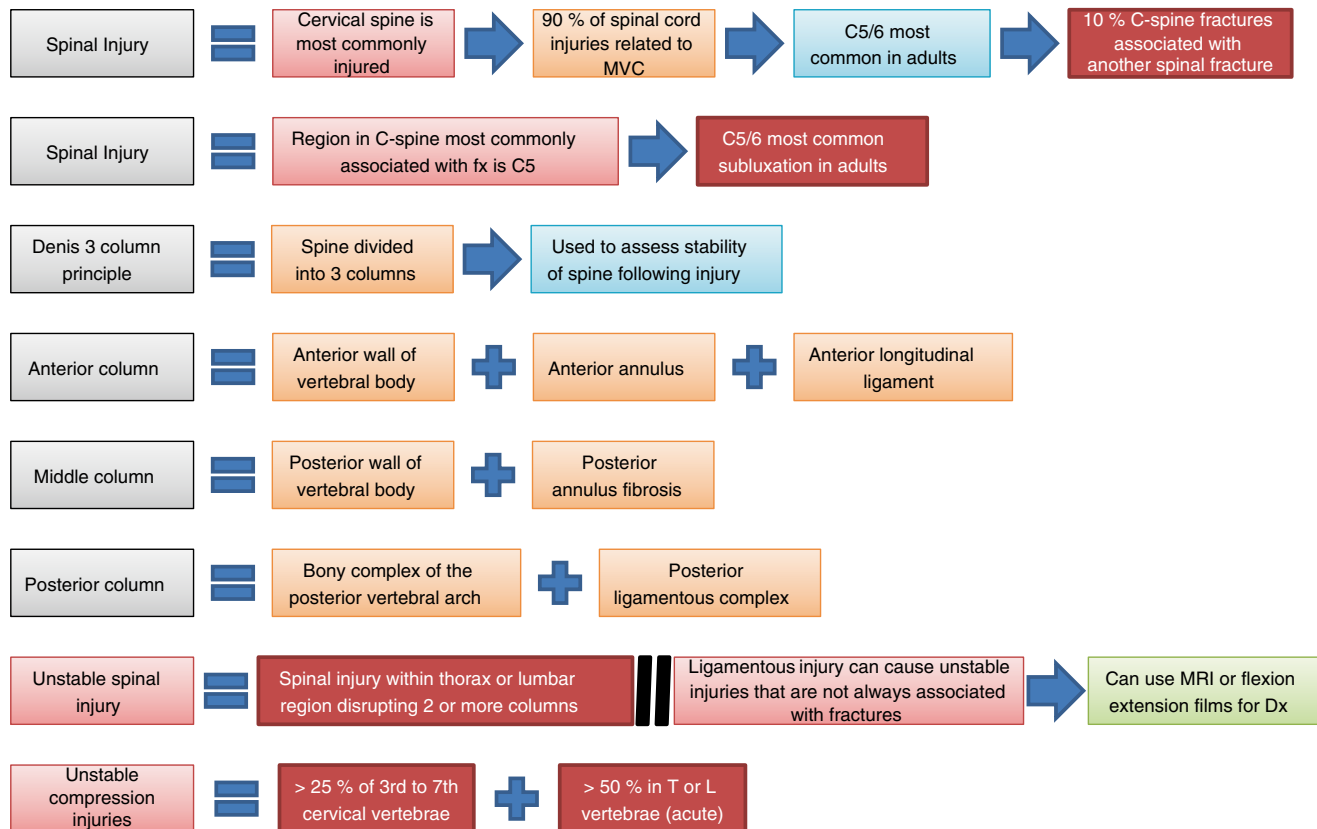


Pediatric Head Trauma

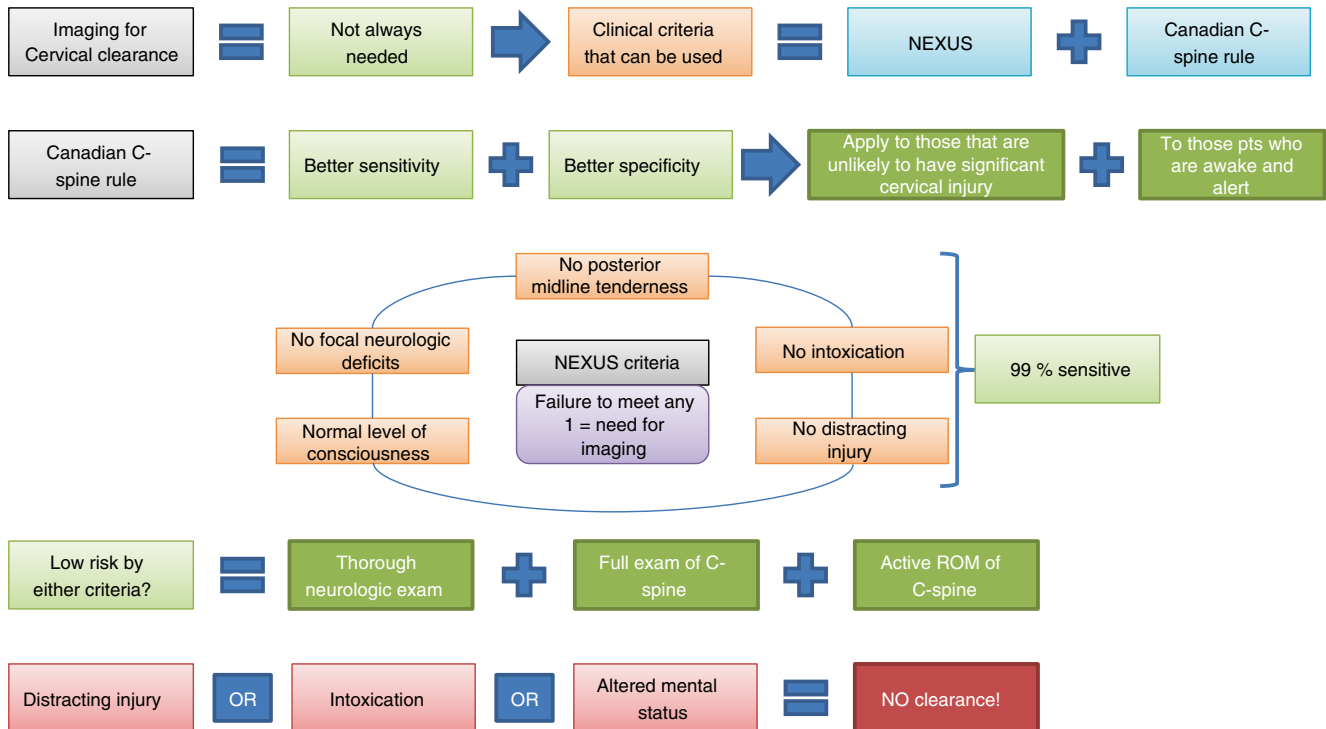


Spinal Injuries

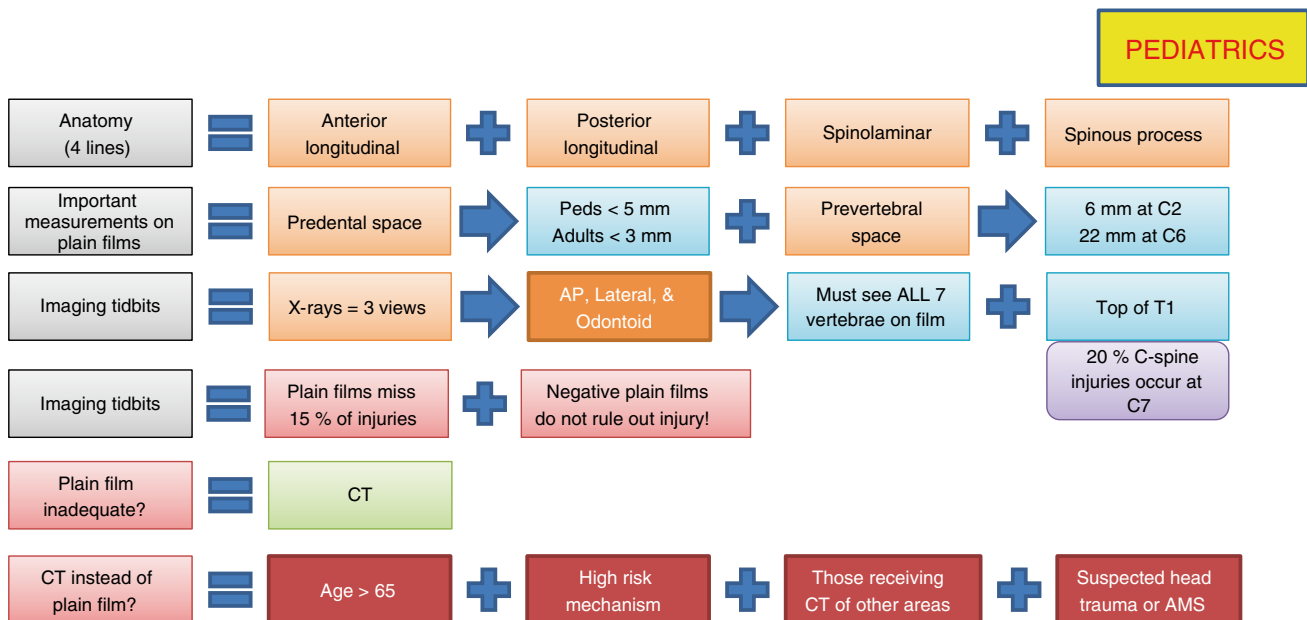
Spinal Injury Introduction



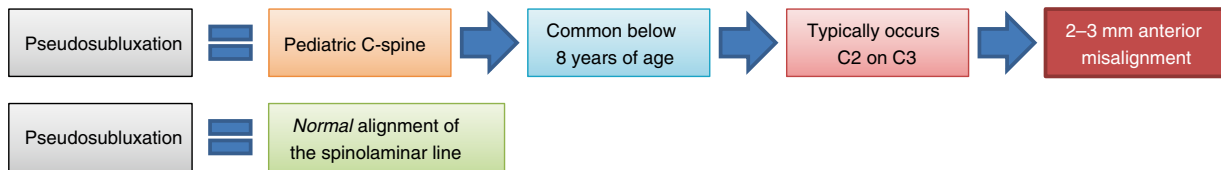
Cervical Spine Clearance



Cervical Spine Evaluation



Pseudosubluxation



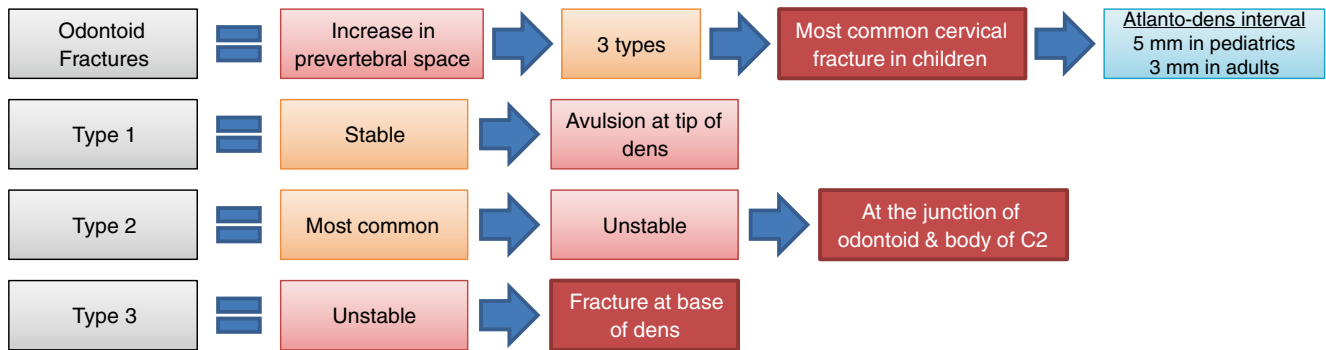
Stable Cervical Fractures

Type of Fracture	Mechanism	Tidbits
Wedge Fracture	Flexion	May be unstable if loss of >50 % of vertebral height
Clay Shoveler's Fracture	Flexion against contracted posterior muscles	Most common at C7 Can occur at C6 & T1
Transverse Process Fracture	Flexion	
Unilateral Facet	Flexion & Rotation	Disruption of posterior ligament complex "Bow-Tie" deformity on lateral X-Ray Is potentially unstable
Burst Fracture	Vertical compression	Becomes unstable if fracture fragments enter spinal canal
Isolated fractures of articular pillar & vertebral body	Vertical compression	
Posterior Neural Arch of C1	Hyperextension	Stable when isolated Arch may be congenitally absent

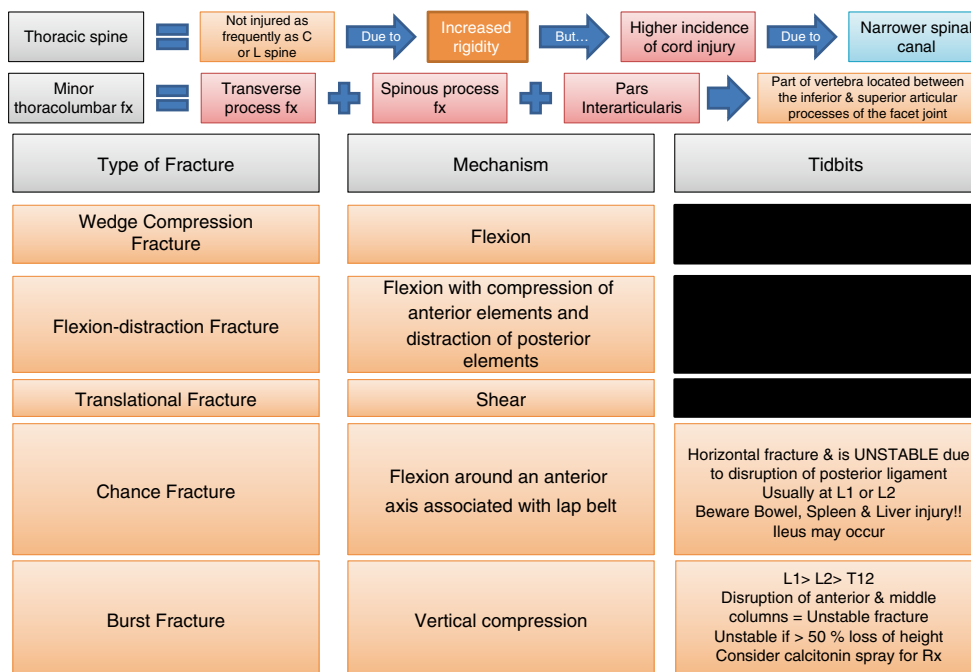
Unstable Cervical Fractures

Type of Fracture	Mechanism	Tidbits
Jefferson Bit Off A Hangman's Thumb		
C1 Burst Fracture (Jefferson Fracture)	Axial load with vertical compression (Diving injury)	Lateral masses of C1 are displaced outward
Bilateral facet dislocation	Flexion	High incidence of spinal cord injuries May see > 5mm subluxation
Odontoid Type II or III	Flexion or Extension	See next page
Atlantoaxial or Atlanto-occipital (or Any Fx/dislocation)	Atlantoaxial or Atlanto-occipital = Flexion or extension	<u>Atlantoaxial</u> C1/2 disruption Rheumatoid arthritis or ankylosing spondylitis
Hangman's Fracture	Extension	Bilateral Fx of pedicles of C2 with forward movement of C2 on C3
Teardrop fractures	Flexion or Extension	Flexion? = extreme flexion with complete ligamentous disruption Extension? = Hyperextension; Associated with central cord syndrome; anterior longitudinal ligament avulses inferior part of vertebral body

Odontoid Fractures



Thoracolumbar Fractures

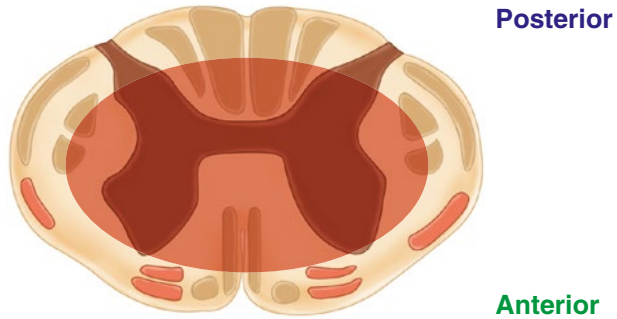


Spinal Cord Injuries

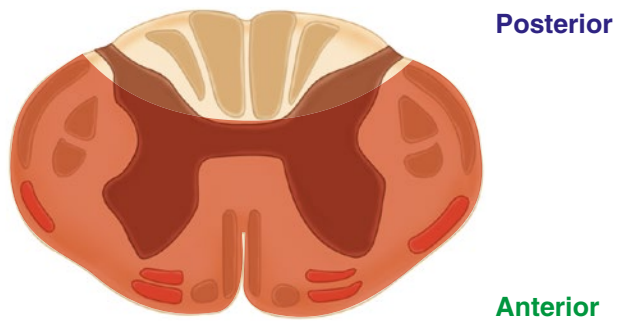
Spinal Cord Syndromes

Incomplete lesions of the spinal cord

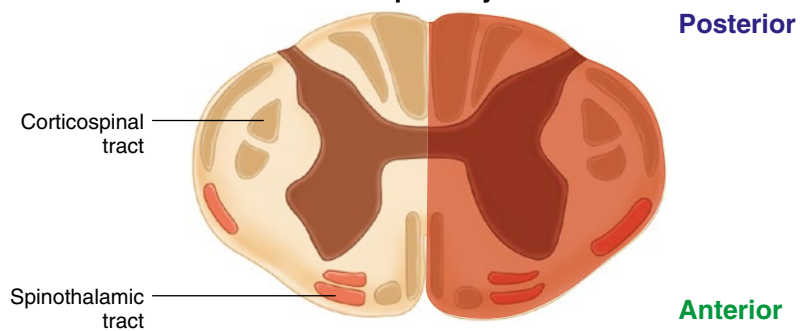
Central cord syndrome



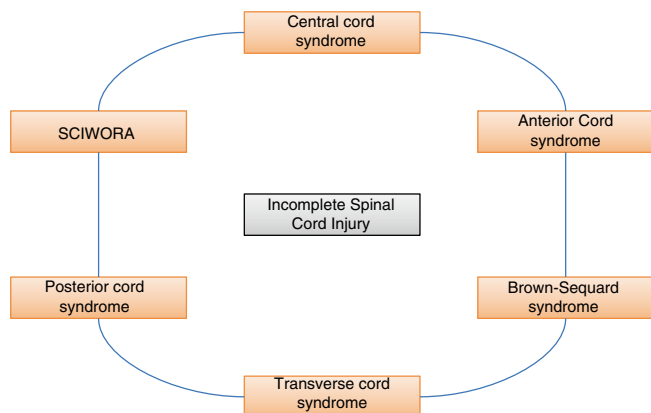
Anterior cord syndrome



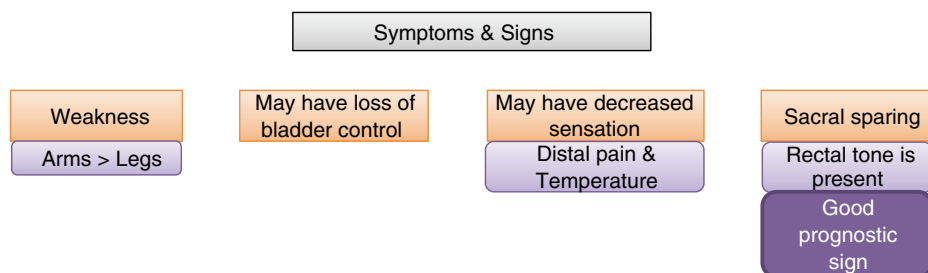
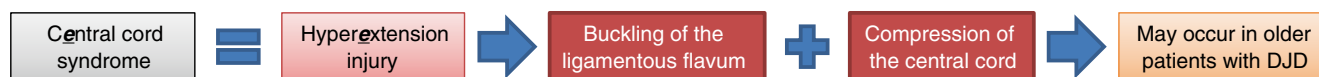
Brown-Sequard syndrome



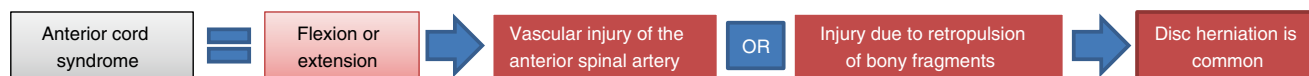
Incomplete Spinal Cord Injury



Central Cord Syndrome



Anterior Cord Syndrome



Symptoms & Signs

Ipsilateral motor paralysis

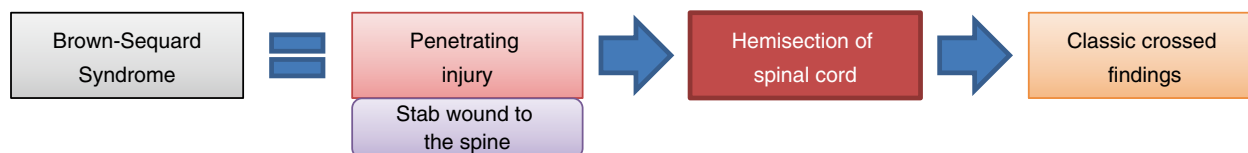
Loss of vibration & proprioception

Contralateral loss of pain & temperature sensation

Treatment

Needs surgical intervention

Brown-Sequard Syndrome



Symptoms & Signs

Complete motor paralysis

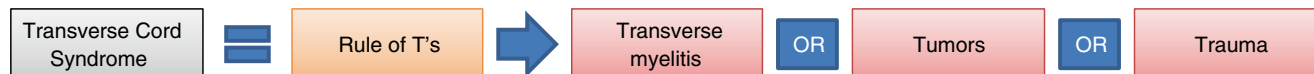
Below injury

Preservation of vibration & proprioception

Loss of pain & temperature sensation

Below injury

Transverse Cord Syndrome



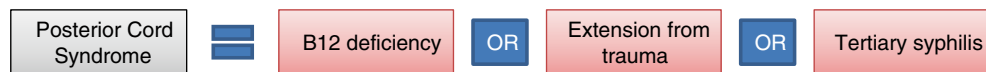
Symptoms & Signs

Complete loss of ALL motor & sensation

Below injury

No sacral sparing

Posterior Cord Syndrome

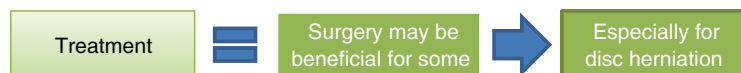
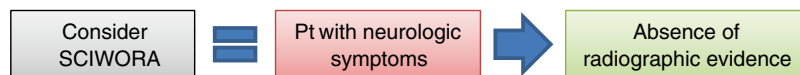


Symptoms & Signs

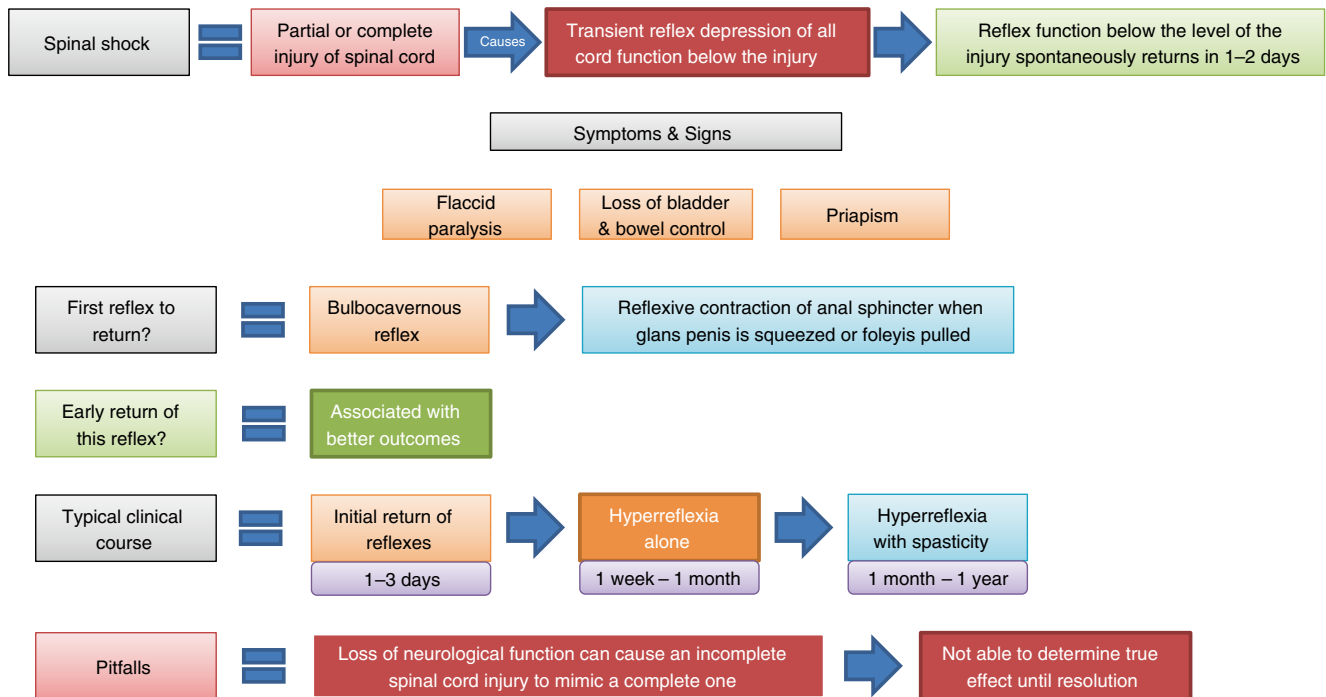
Loss of position & vibration
Below injury

SCIWORA

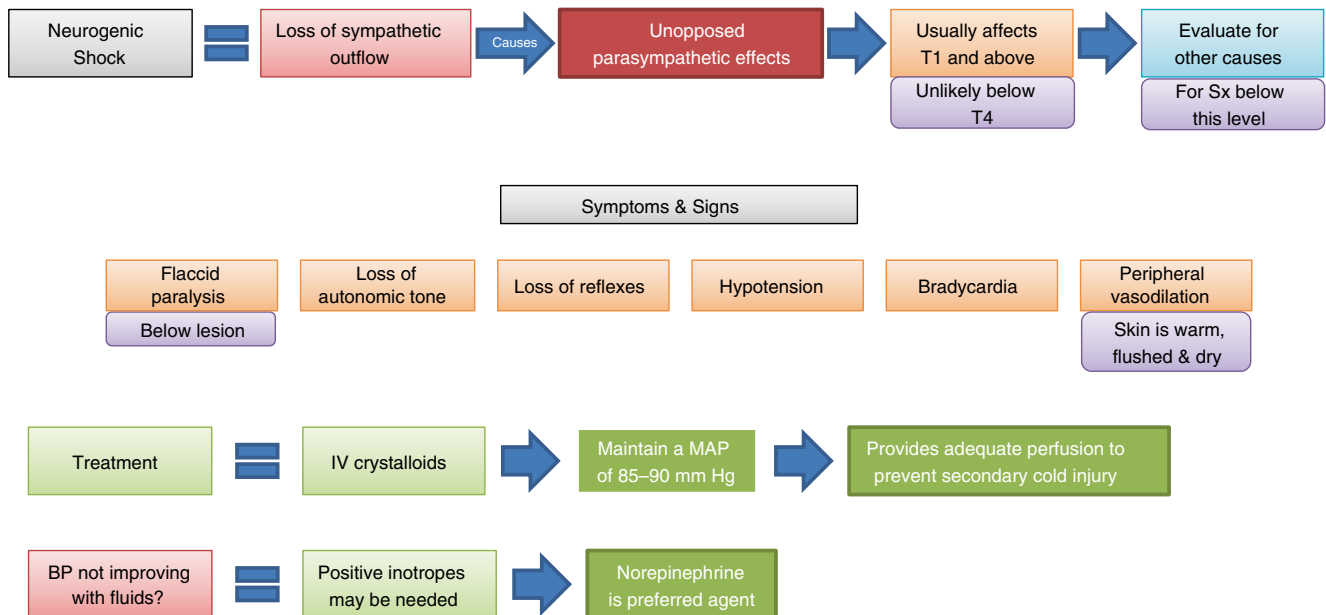
PEDIATRICS



Spinal Shock

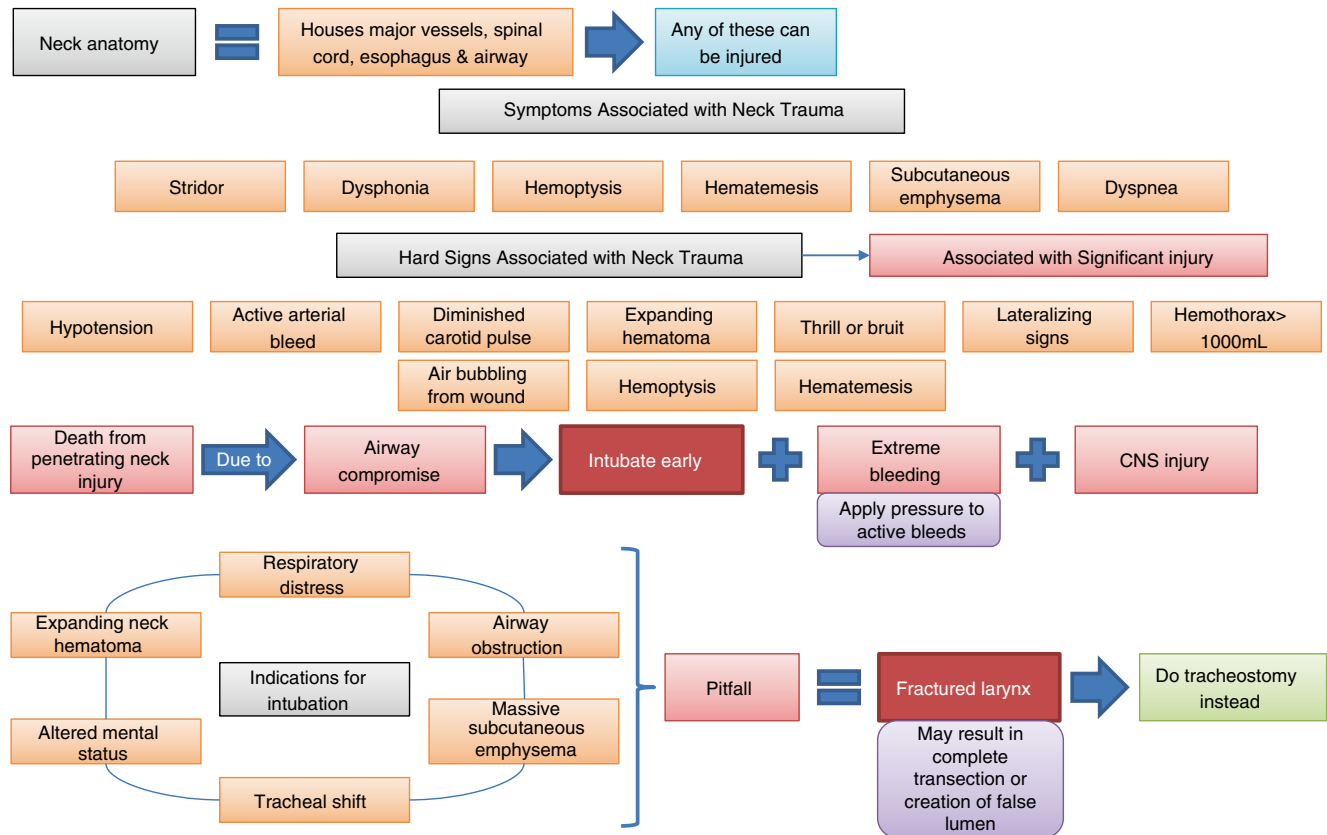


Neurogenic Shock

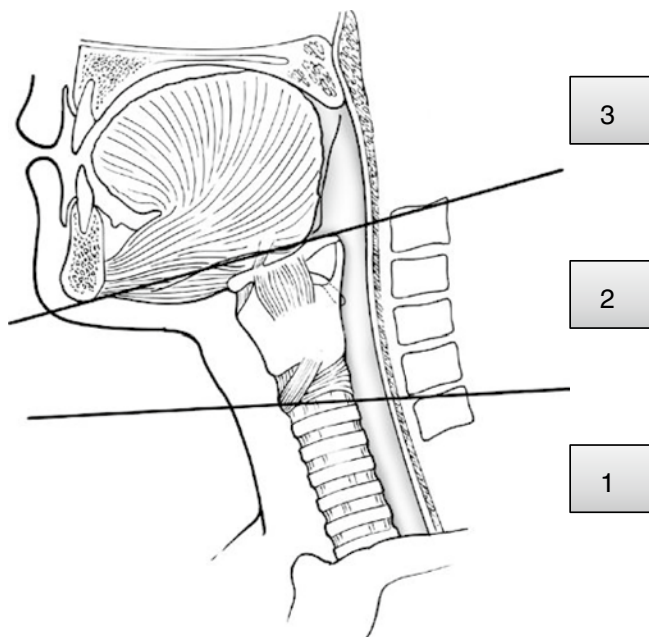
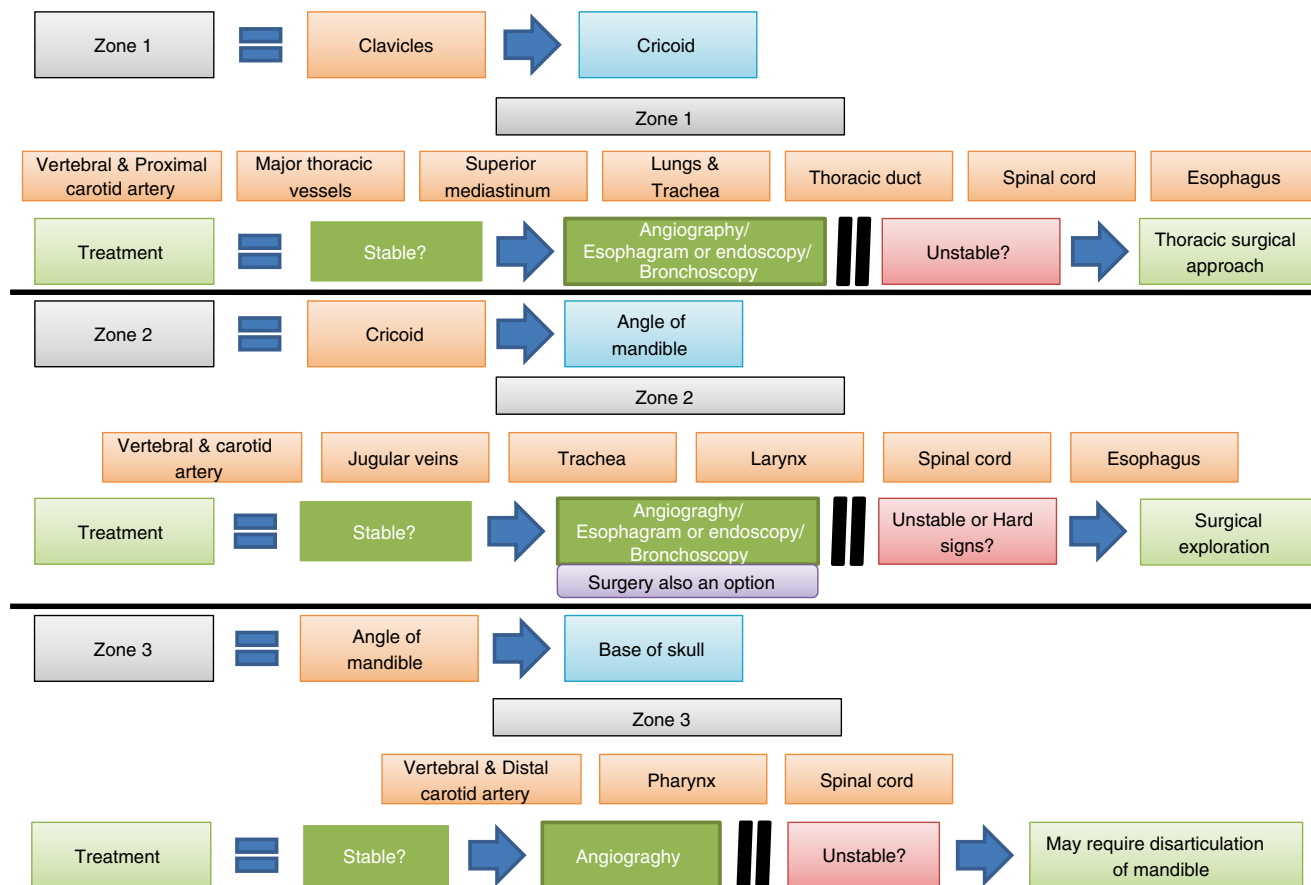


Penetrating Neck Injury

Penetrating Neck Injury Introduction

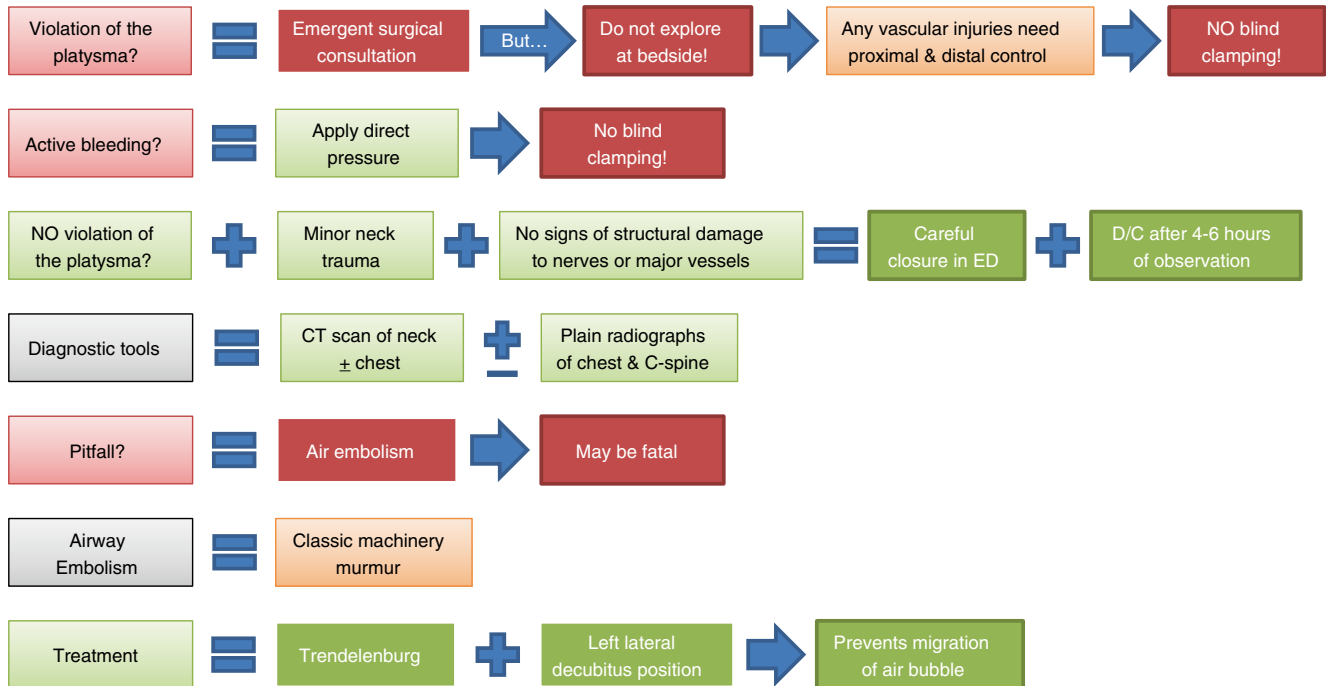


Zones of the Neck



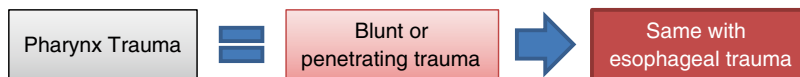
Center image (Reprinted from Ustin J. Access to the neck in penetrating trauma. In: Velmahos GC, Degiannis E, Doll D, editors. Penetrating trauma. Heidelberg: Springer Verlag; 2012. p. 37–45. With permission from Springer Verlag)

General Treatment of Penetrating Neck Trauma



Pharynx Trauma

Larynx trauma
see ENT



Symptoms & Signs

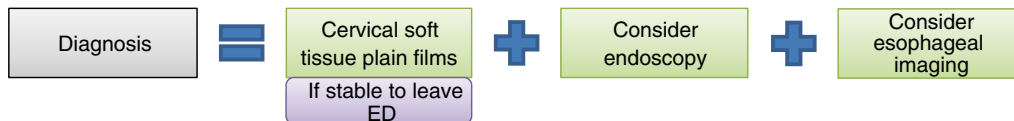
Hematemesis

Odynophagia

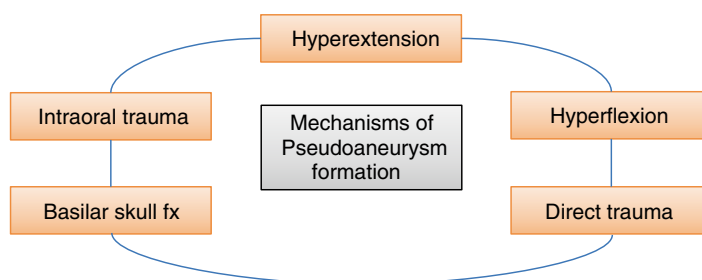
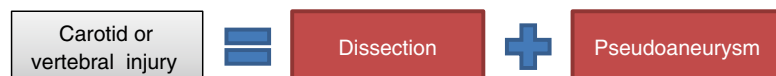
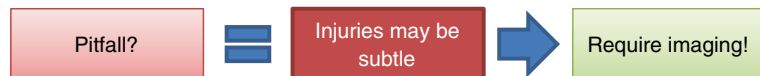
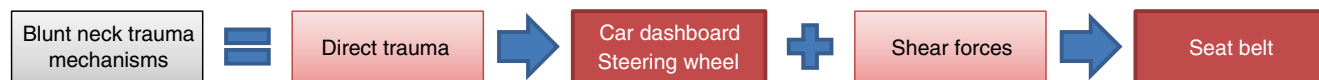
SQ emphysema

Pneumomediastinal
air

Retropharyngeal
air

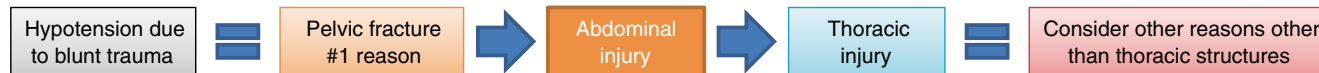


Blunt Neck Trauma

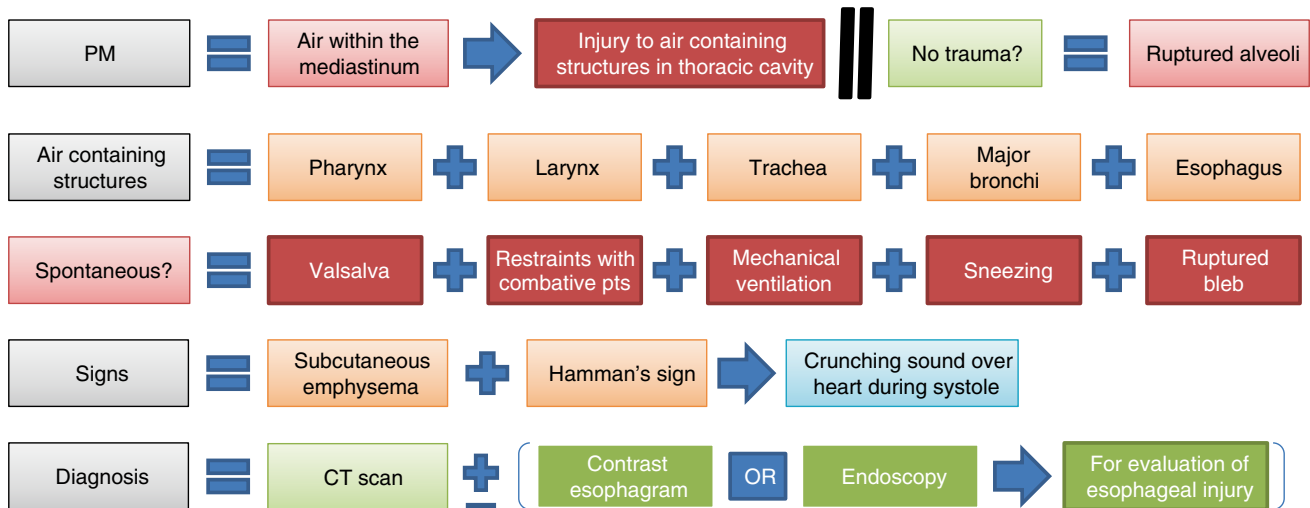


Chest Trauma

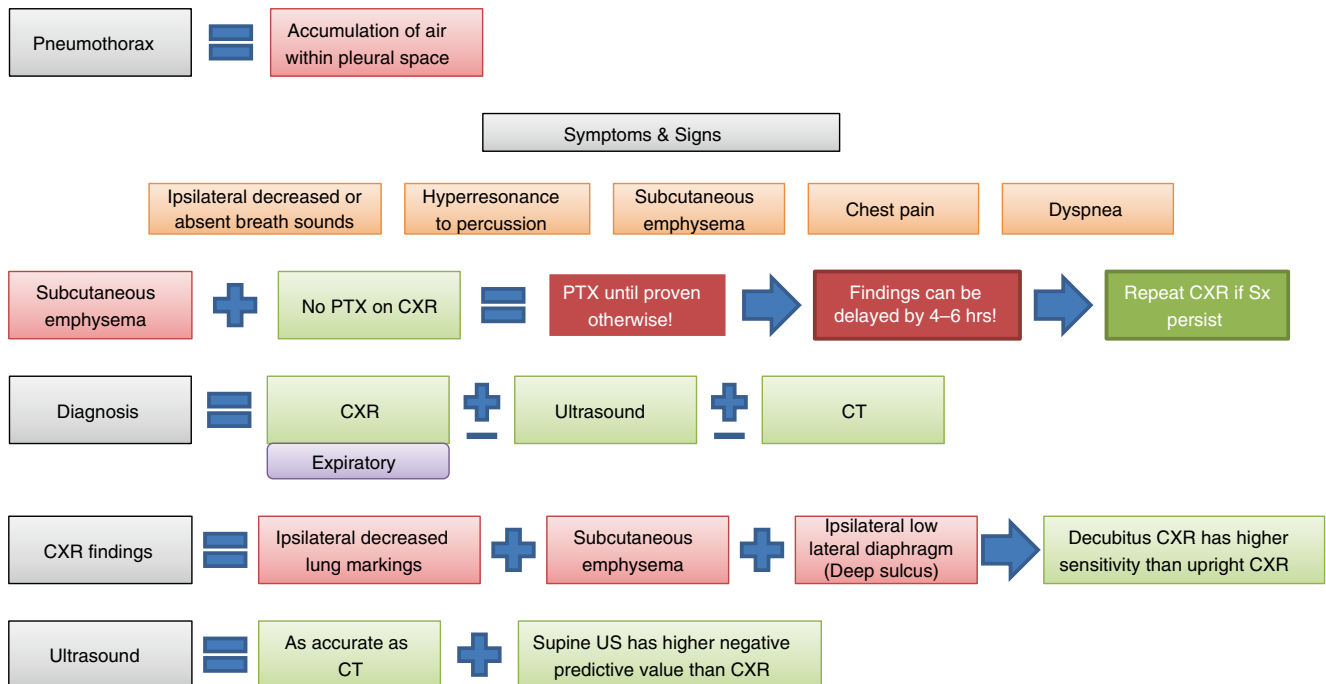
Chest Trauma Tidbits



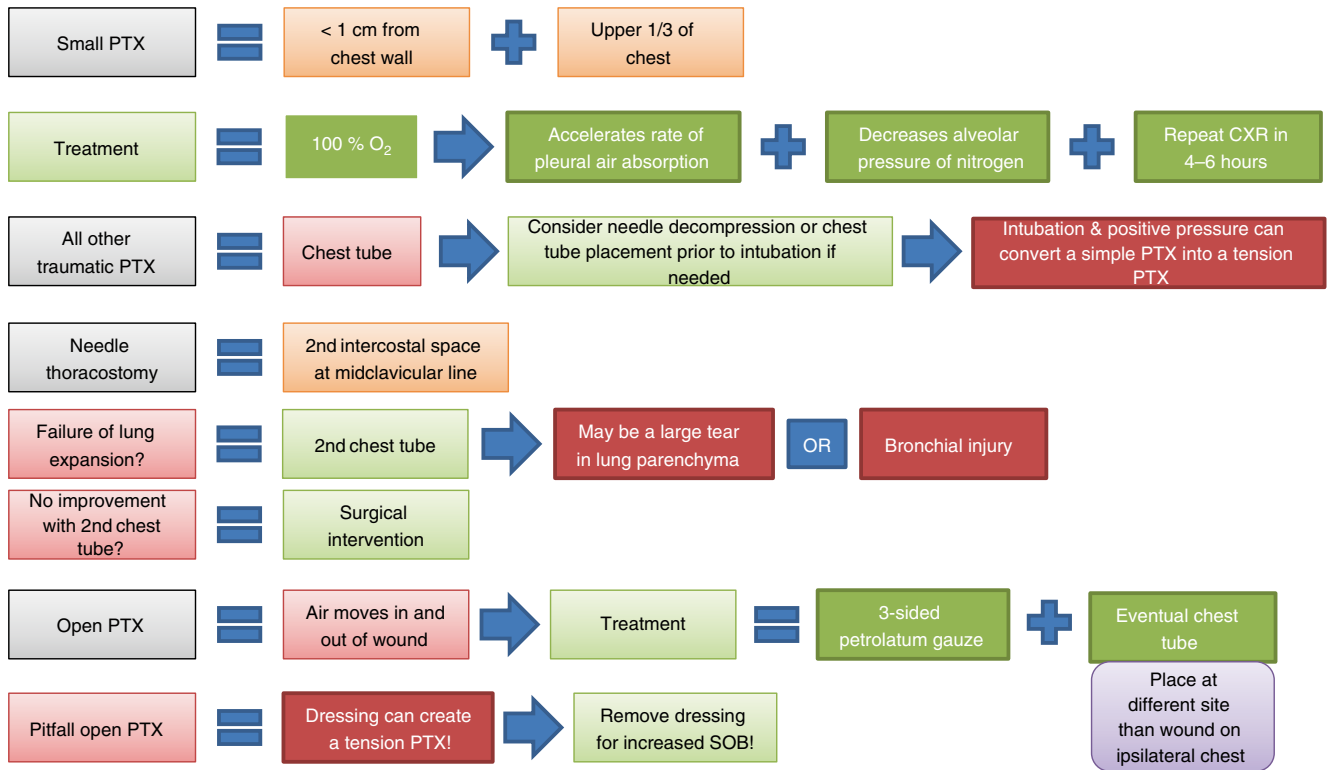
Pneumomediastinum (PM)



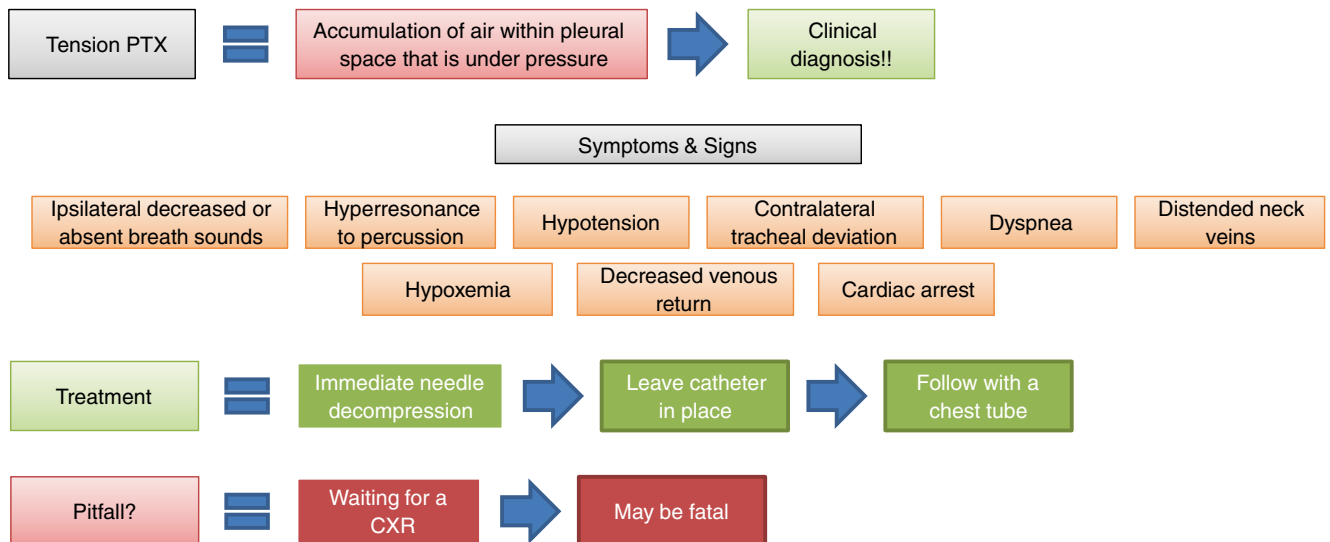
Pneumothorax (PTX)



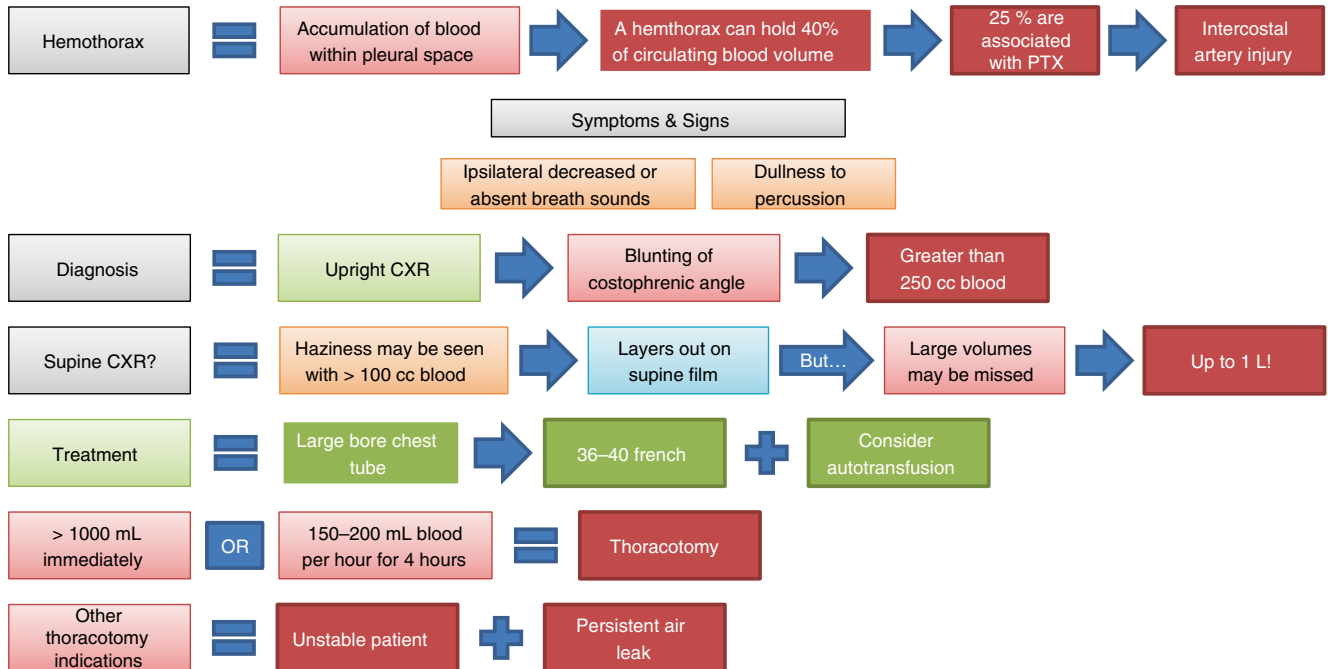
Pneumothorax Treatment



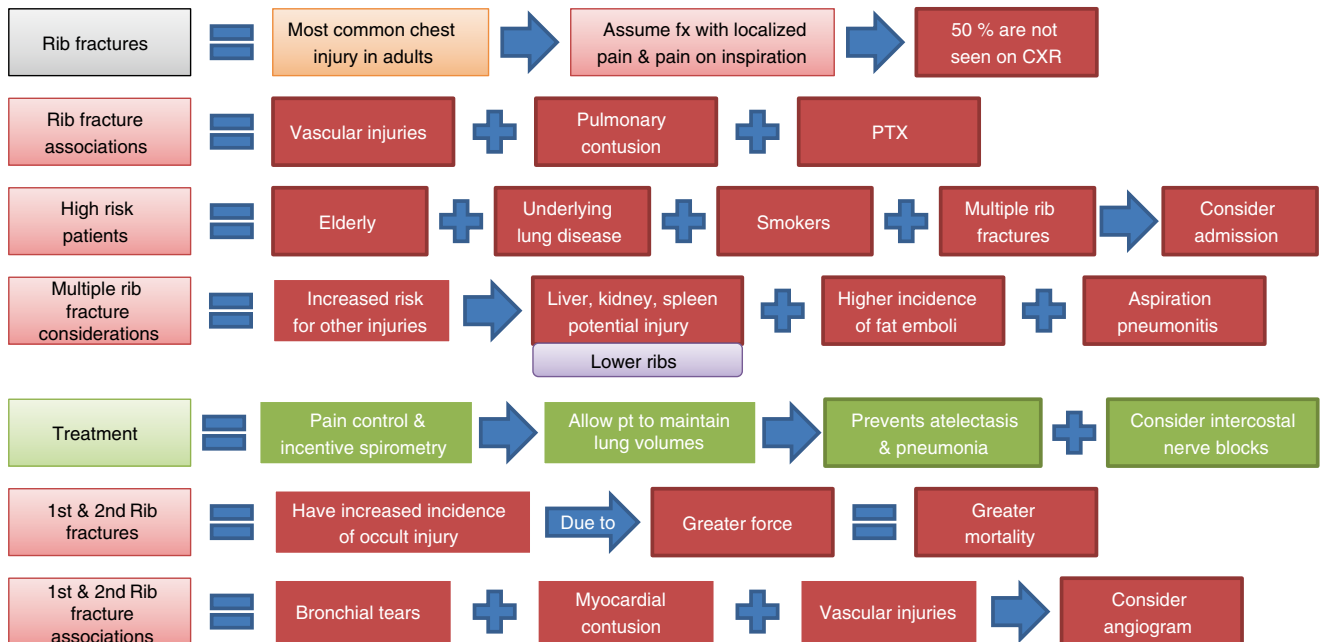
Tension Pneumothorax



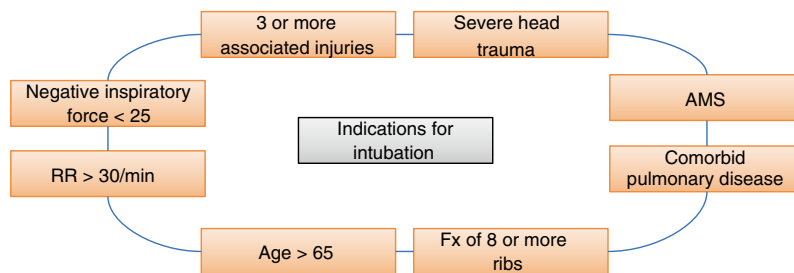
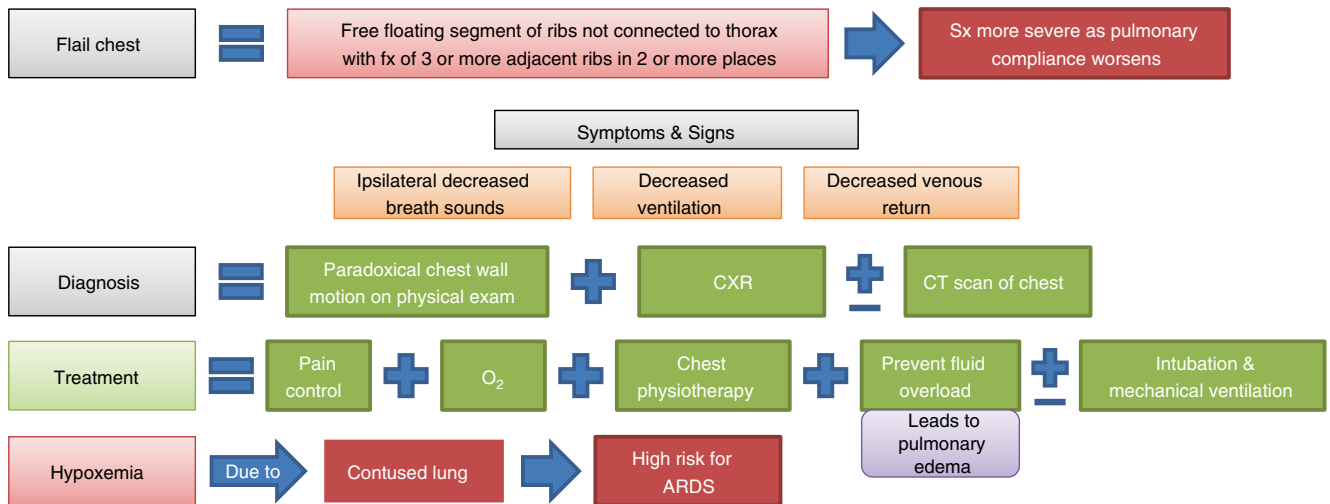
Hemothorax



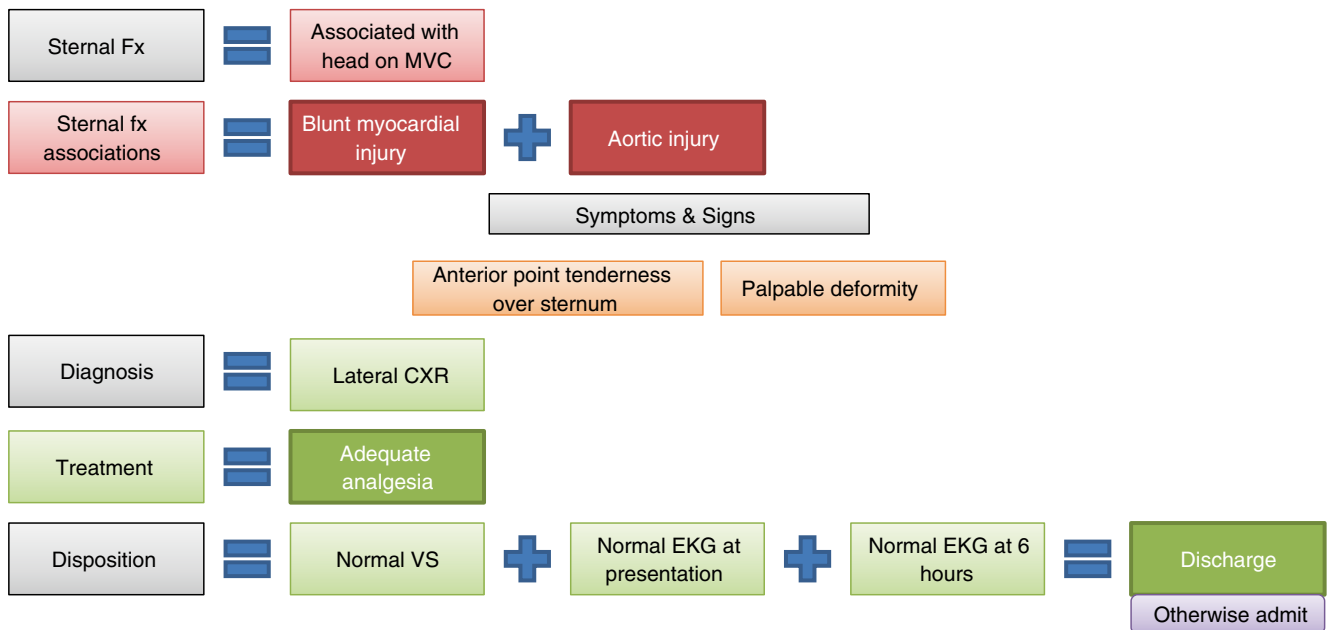
Rib Fractures



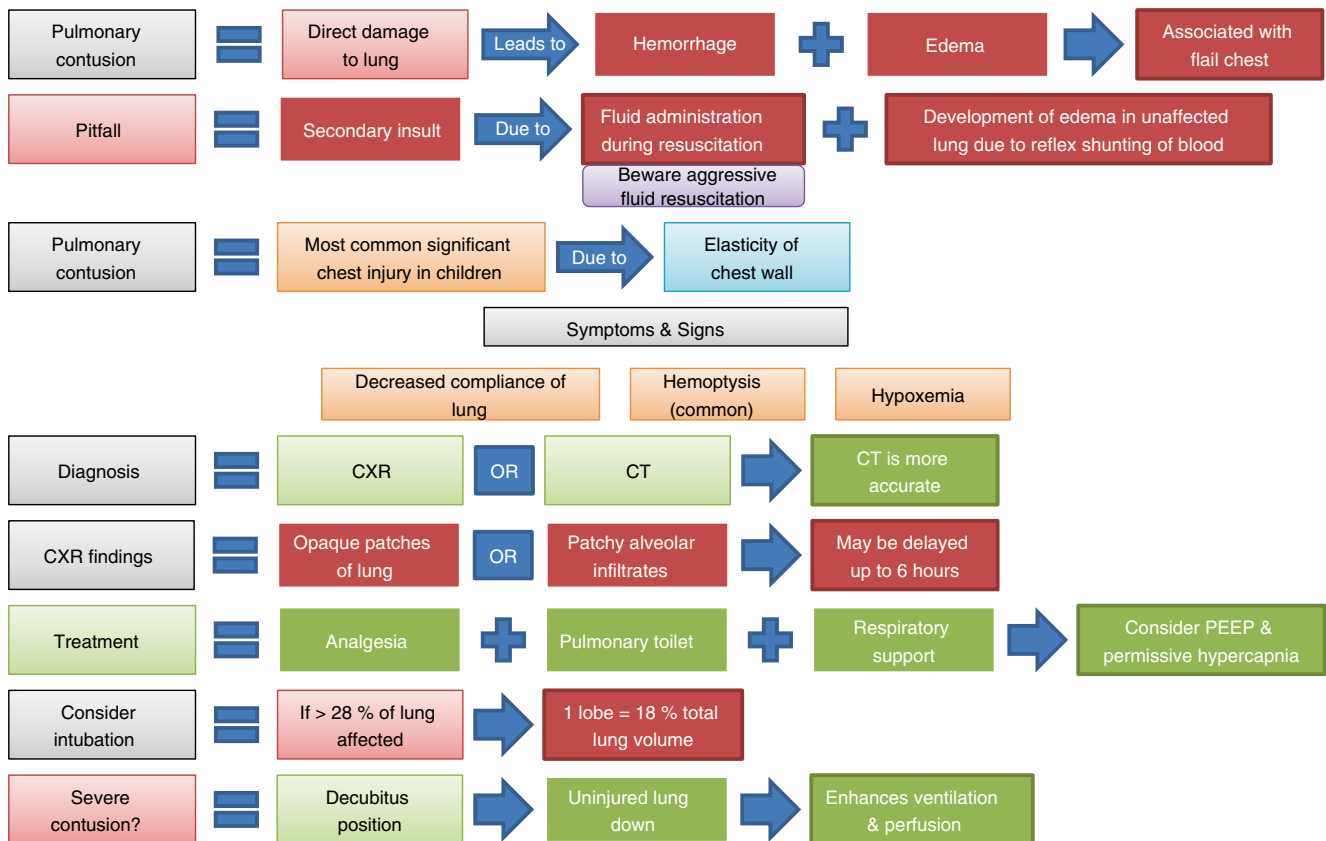
Flail Chest



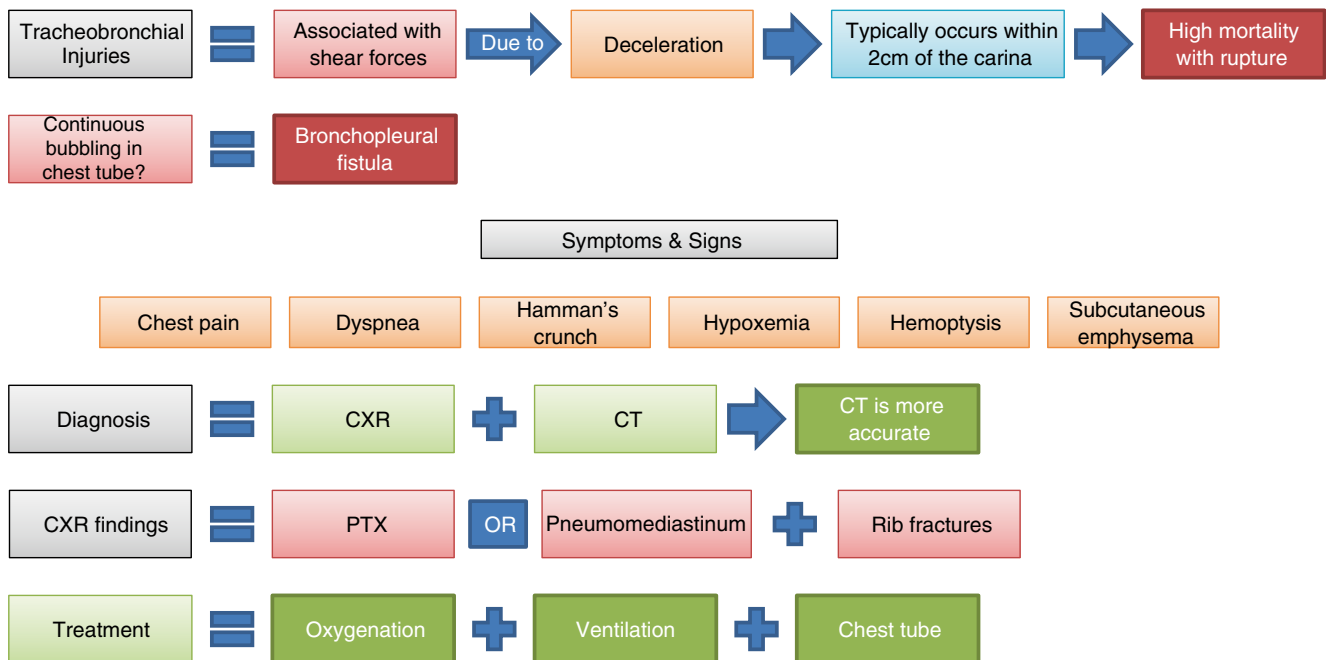
Sternal Fracture



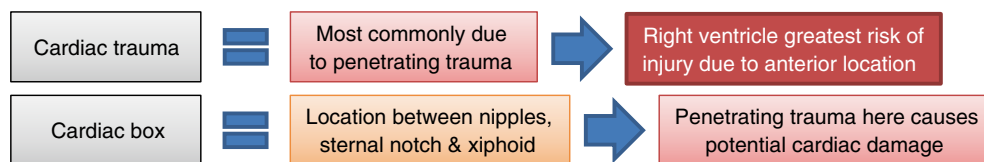
Pulmonary Contusion



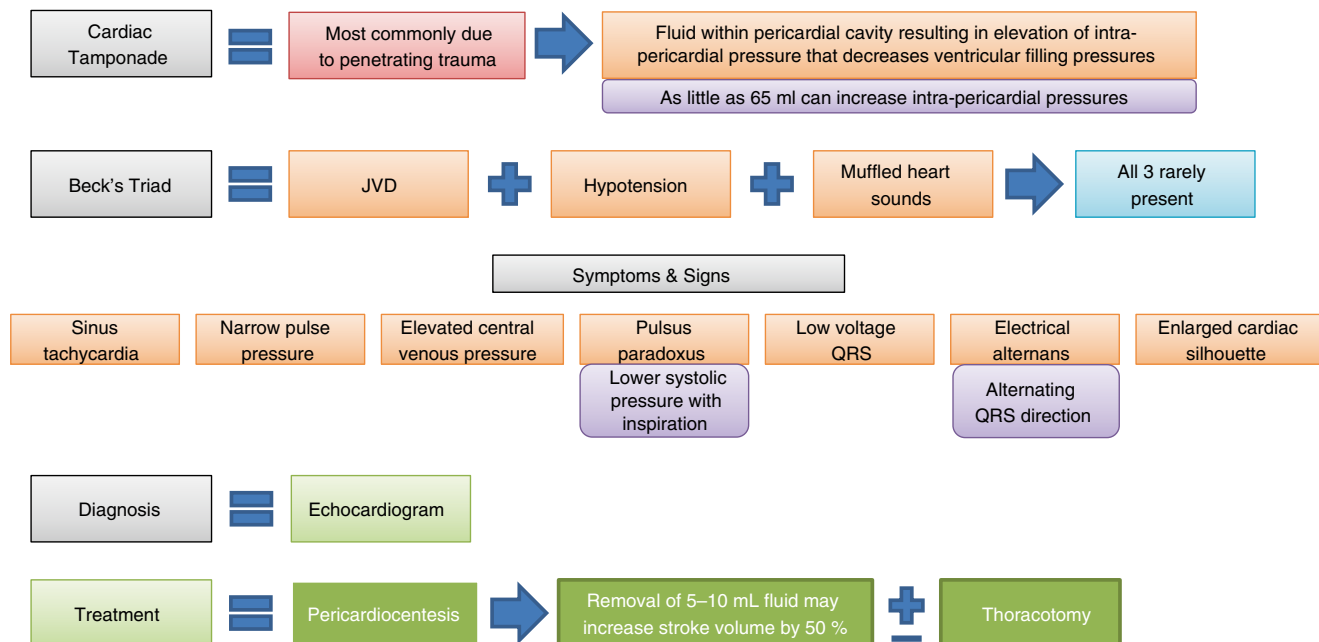
Tracheobronchial Injuries



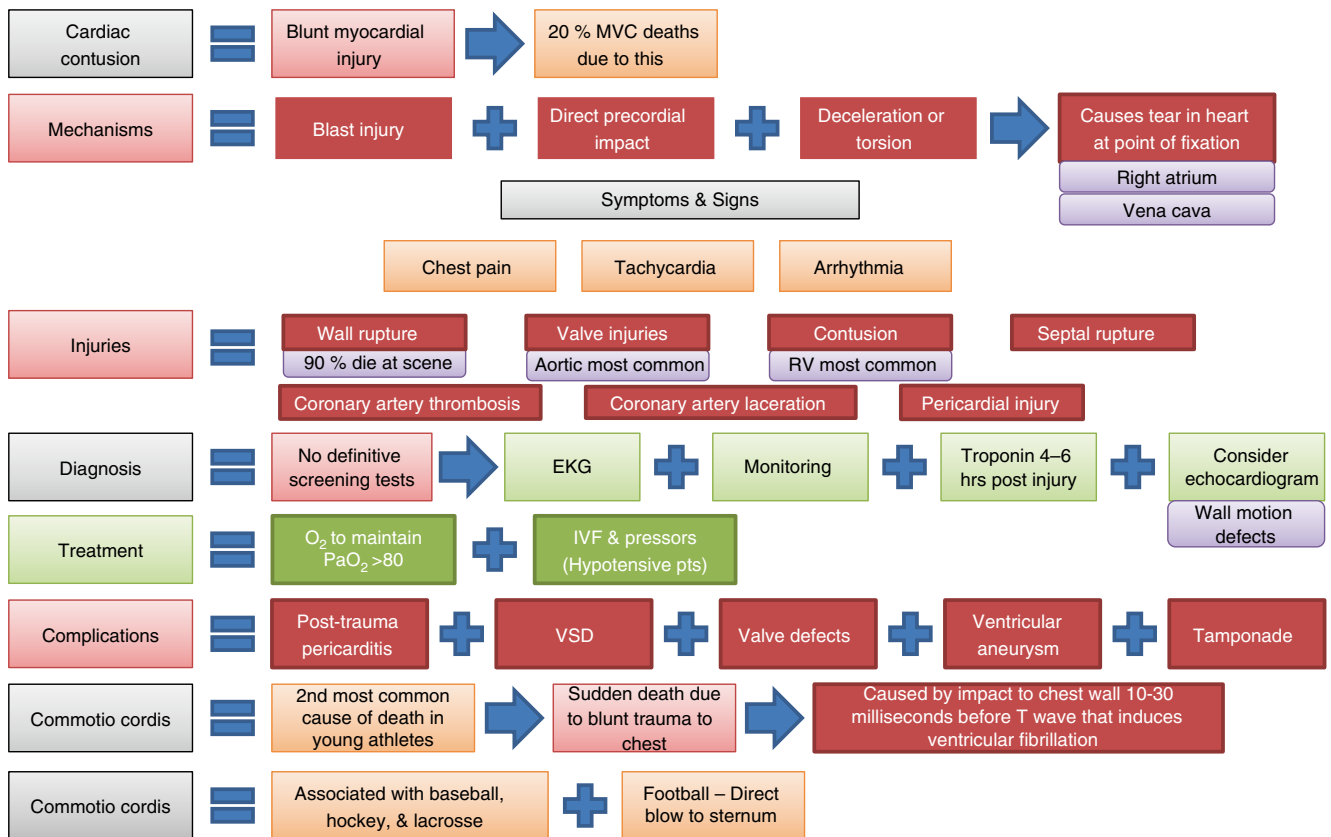
Cardiac Trauma



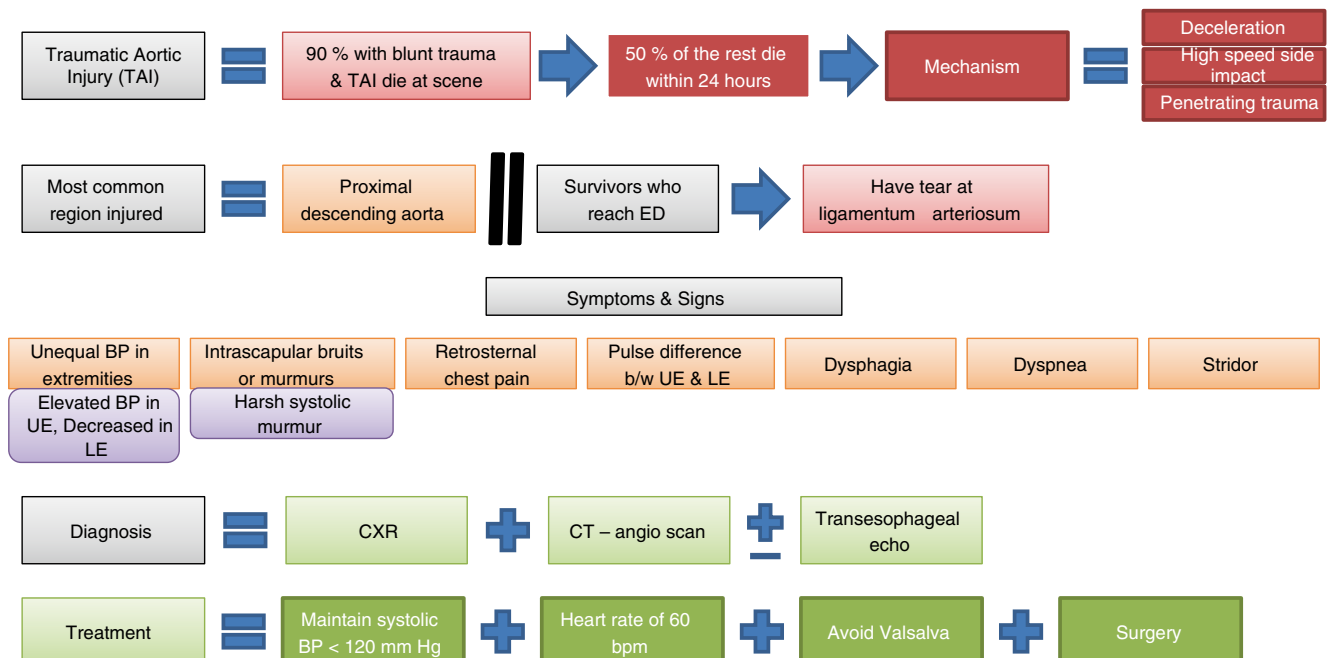
Cardiac Tamponade



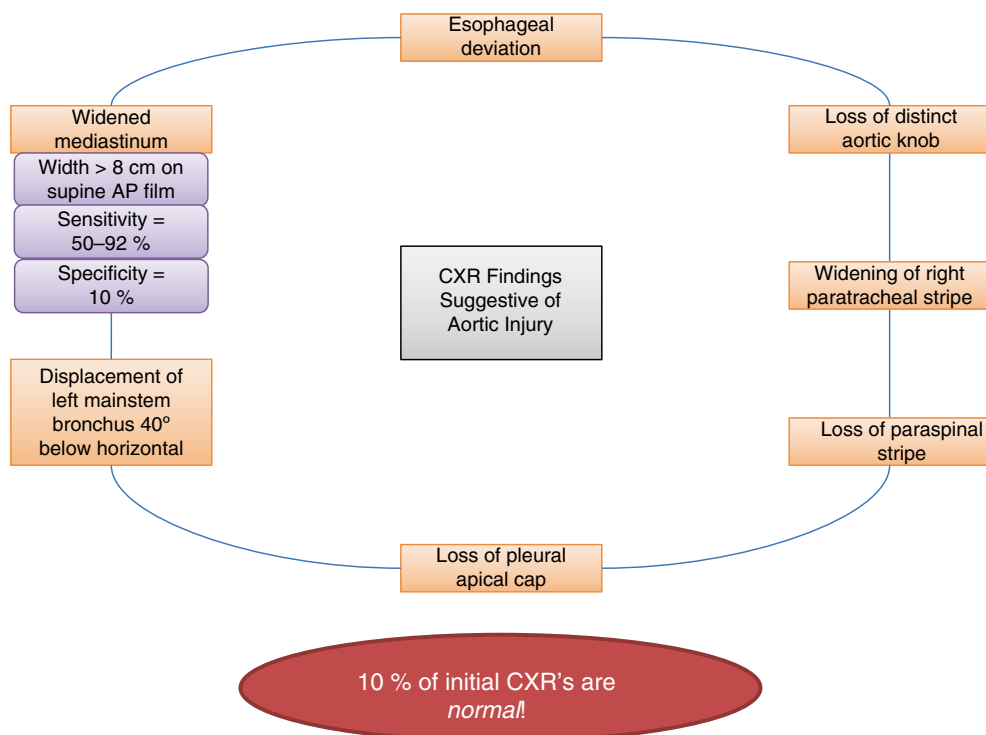
Cardiac Contusion



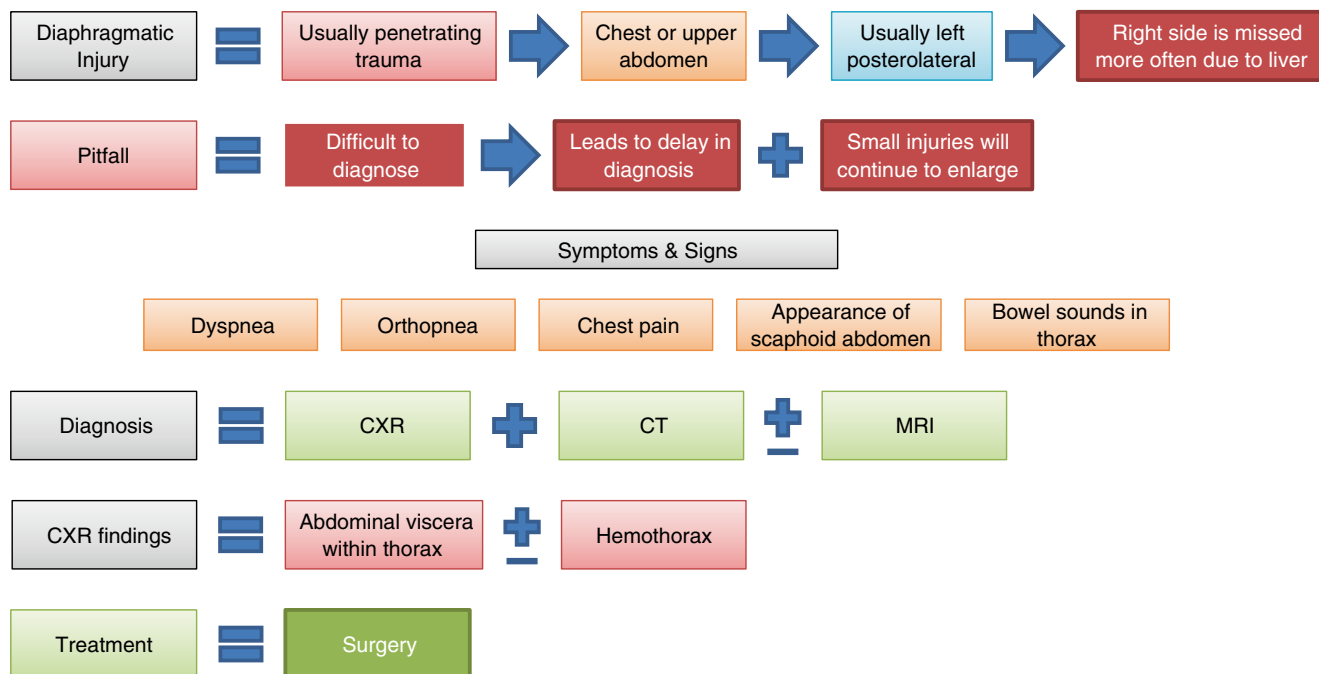
Traumatic Aortic Injury (TAI)



CXR Findings Suggestive of Aortic Injury

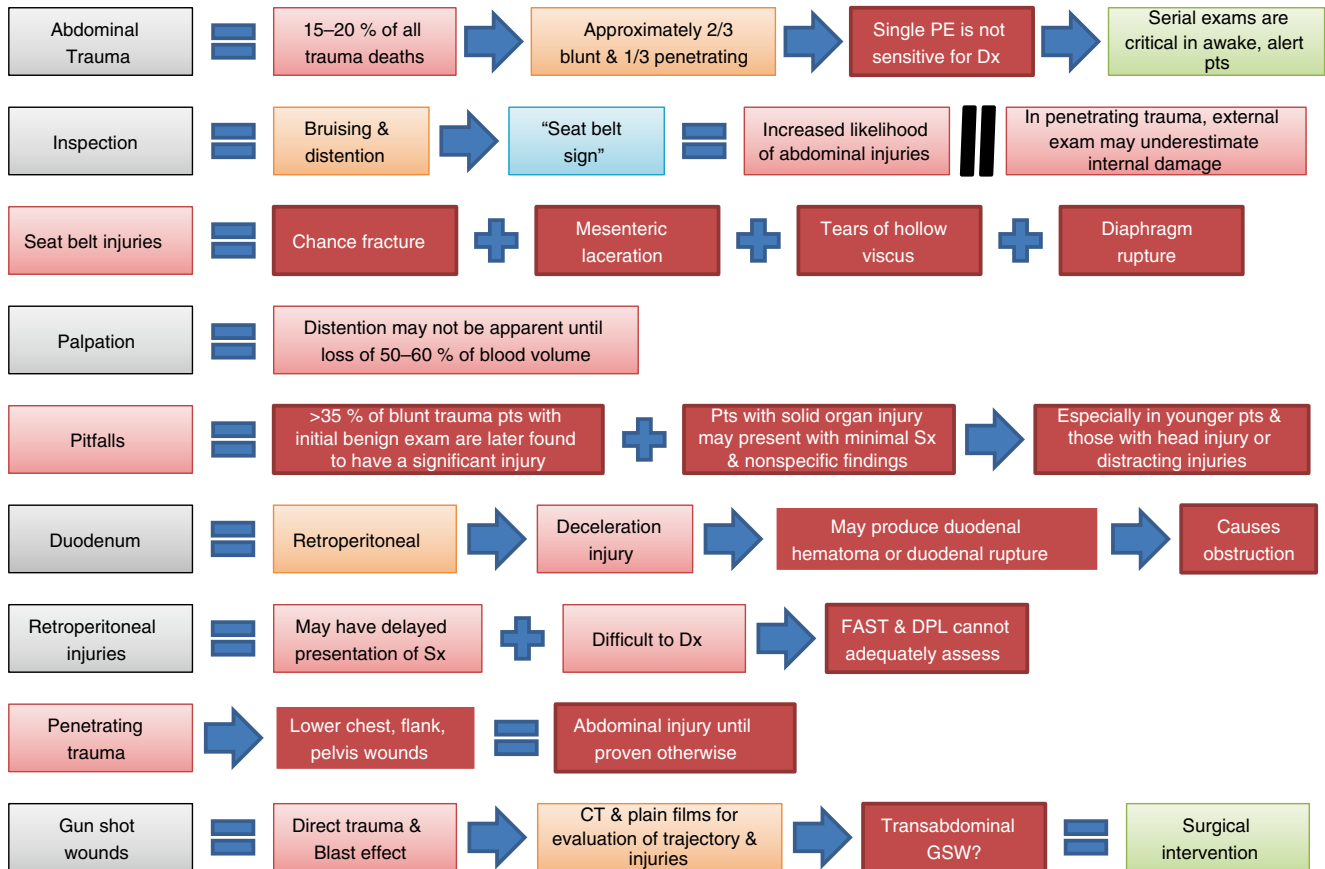


Diaphragmatic Injury



Abdominal Trauma

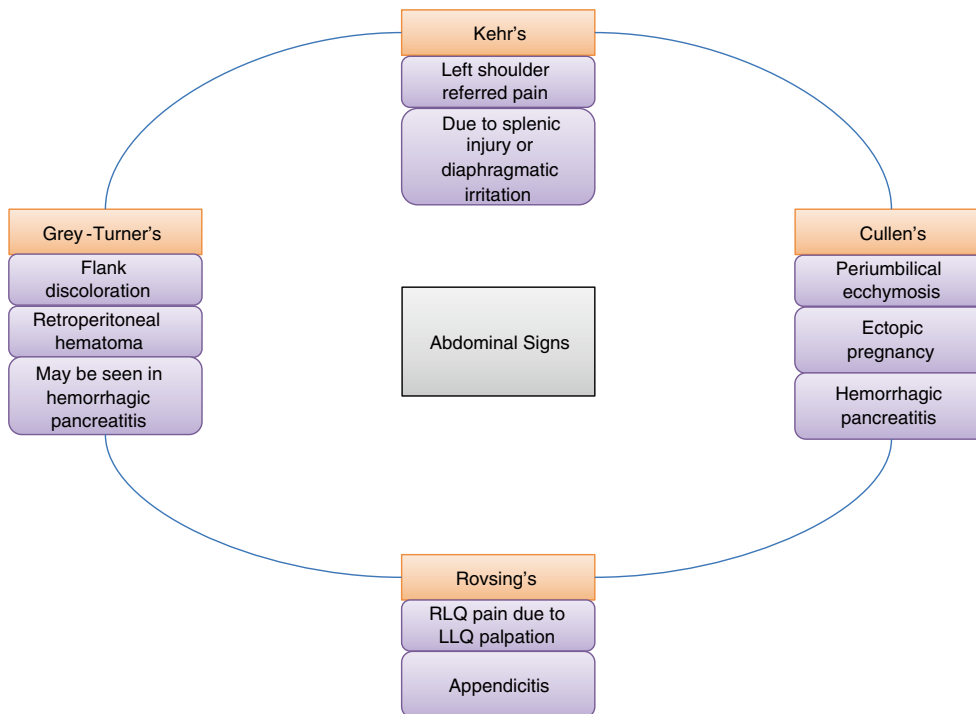
Abdominal Trauma Introduction



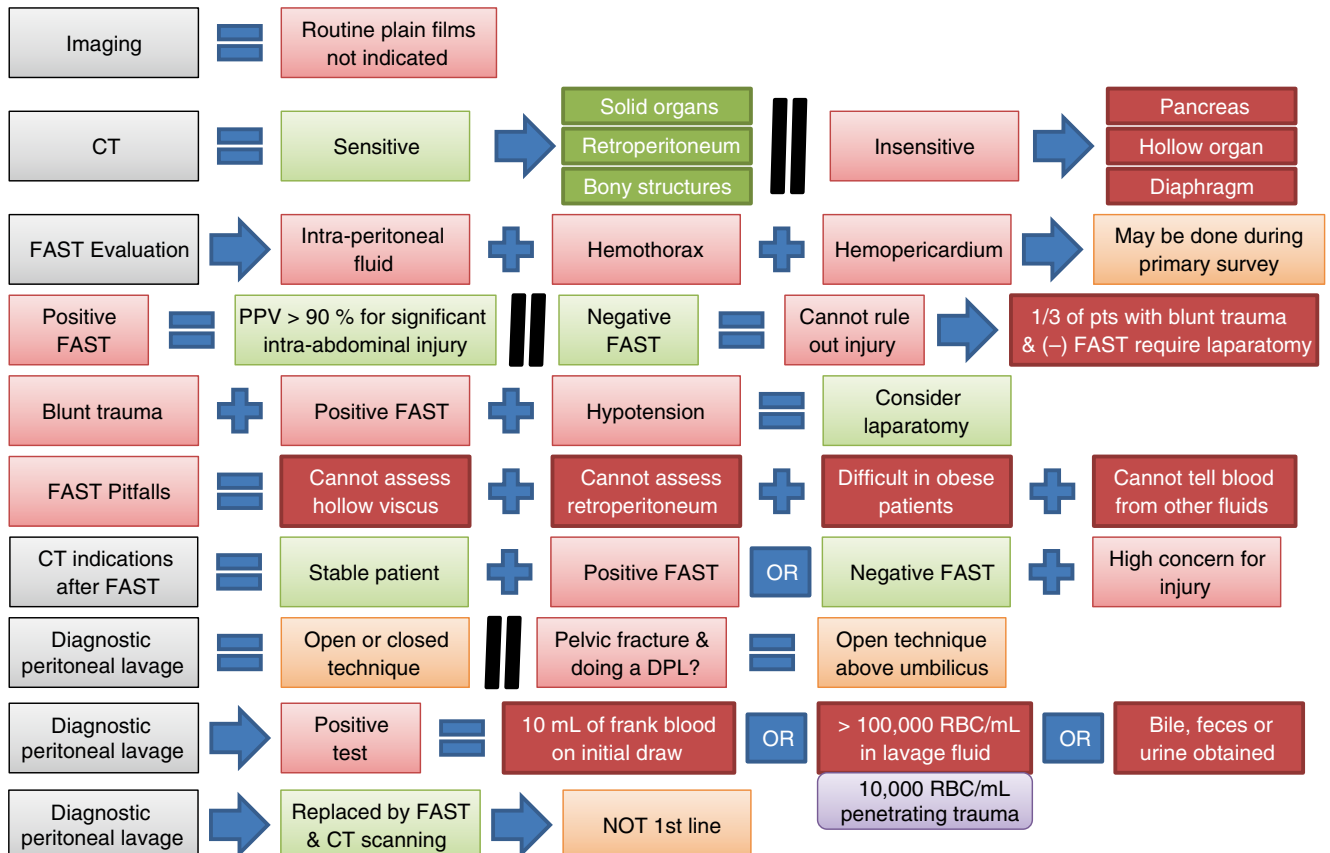
Penetrating Abdominal Trauma



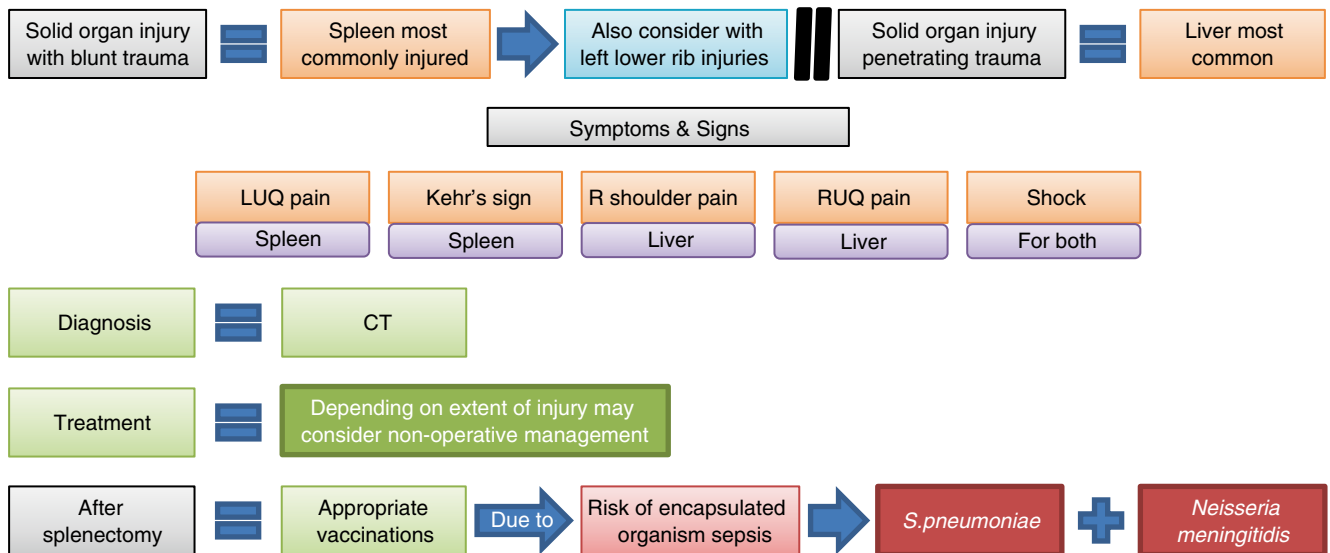
Abdominal Signs



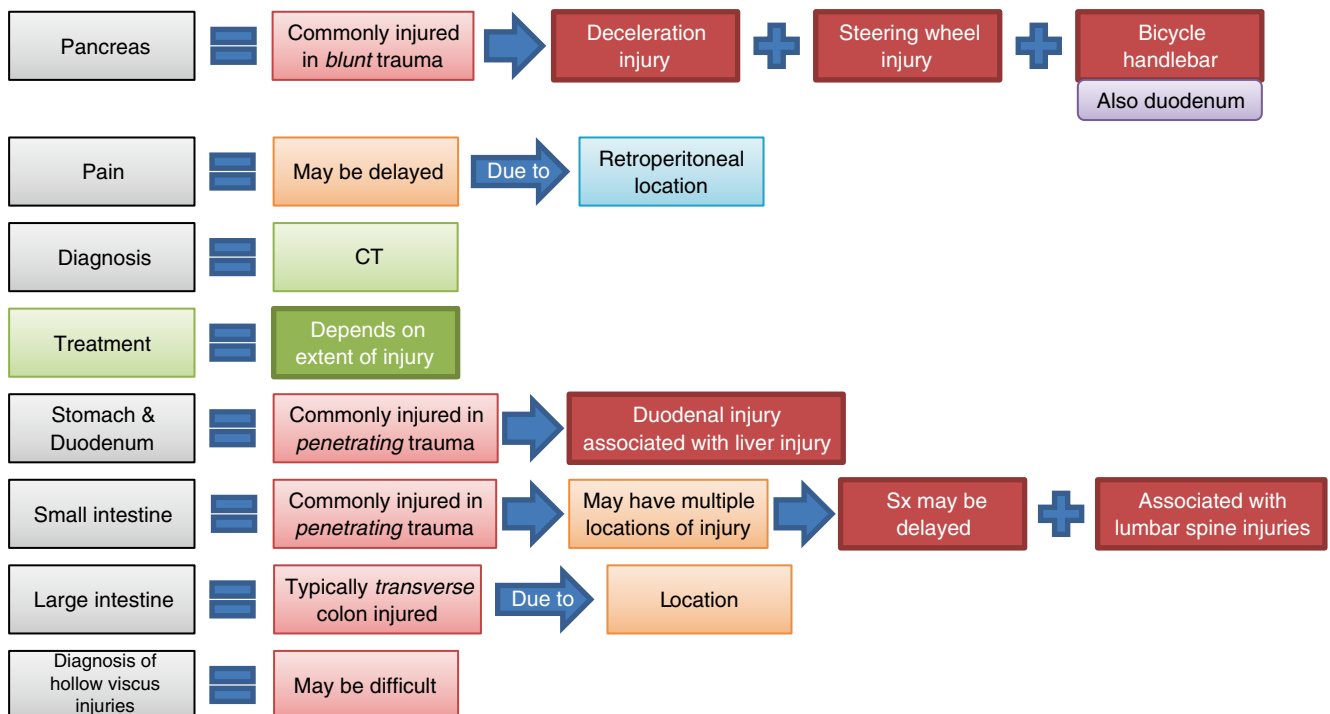
Abdominal Trauma Imaging



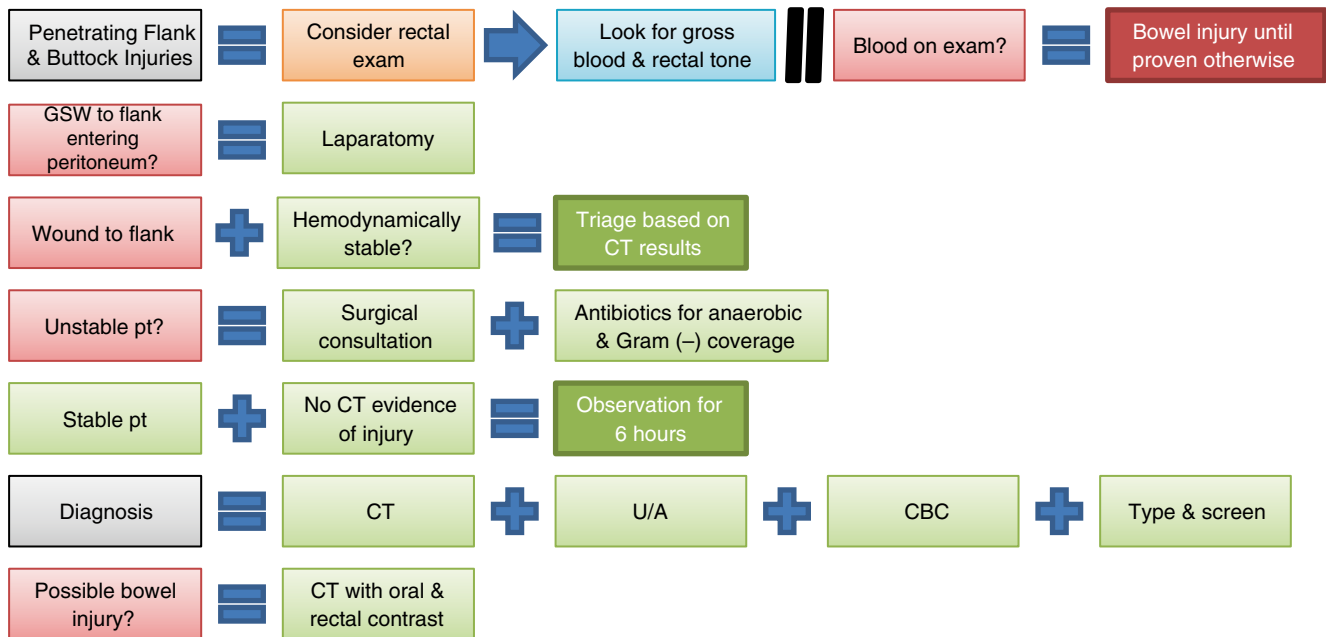
Spleen and Liver Trauma



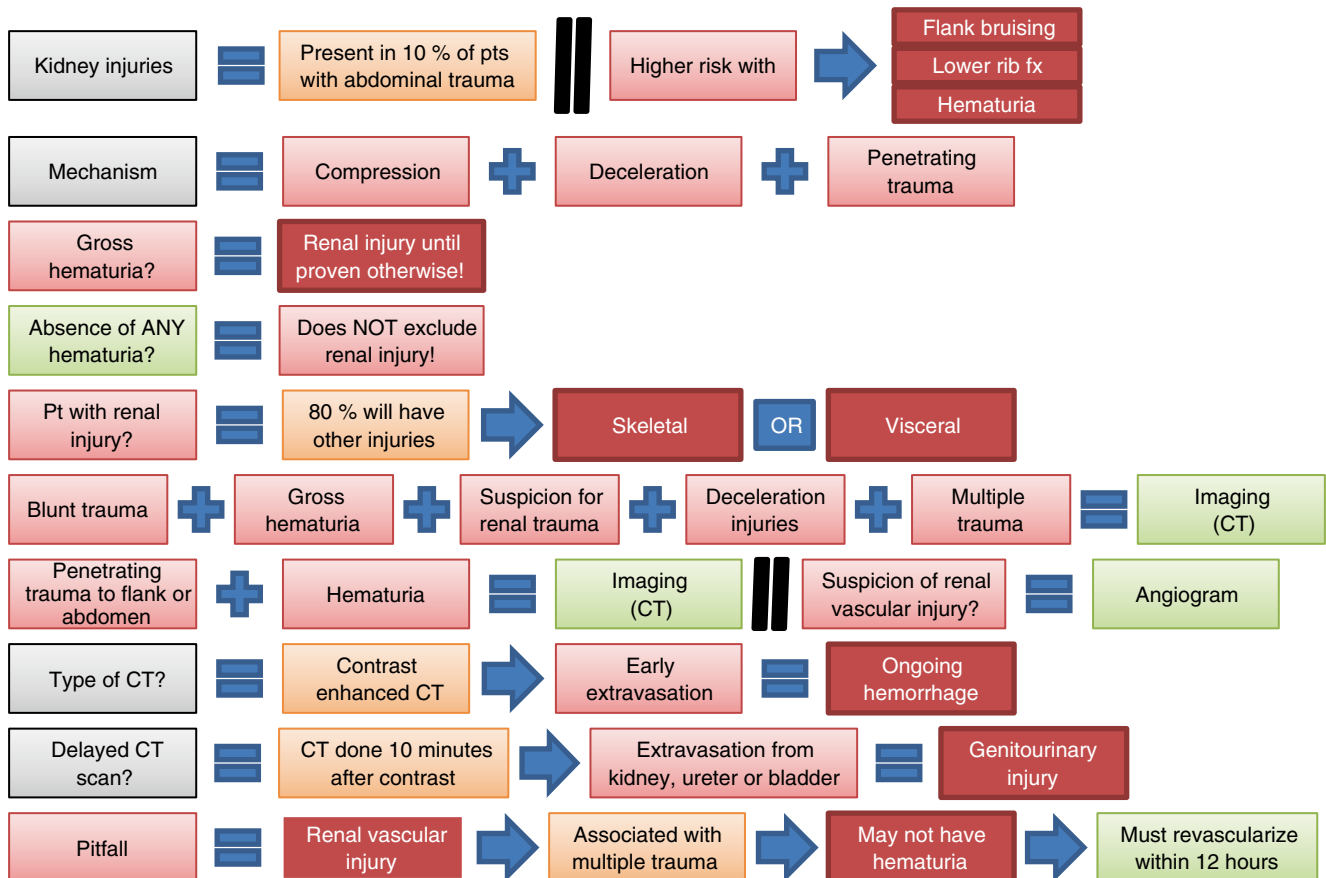
Pancreas/Stomach/Duodenum/Intestine Trauma



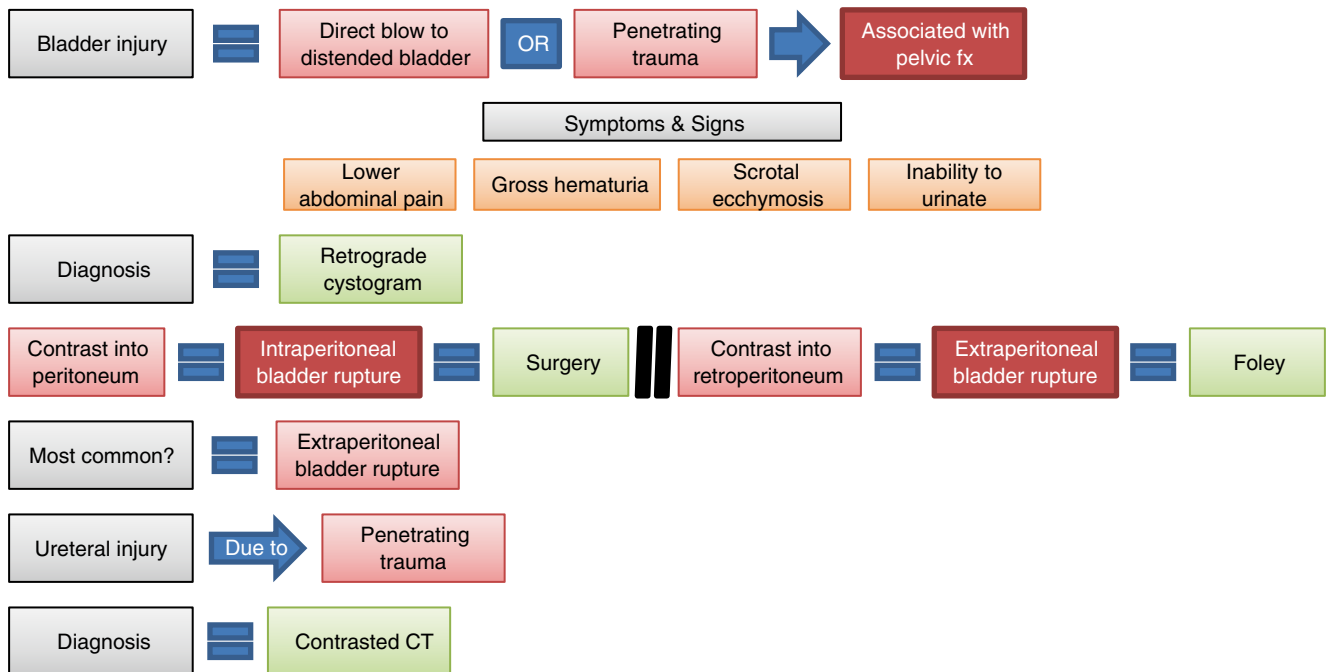
Penetrating Flank and Buttock Injuries



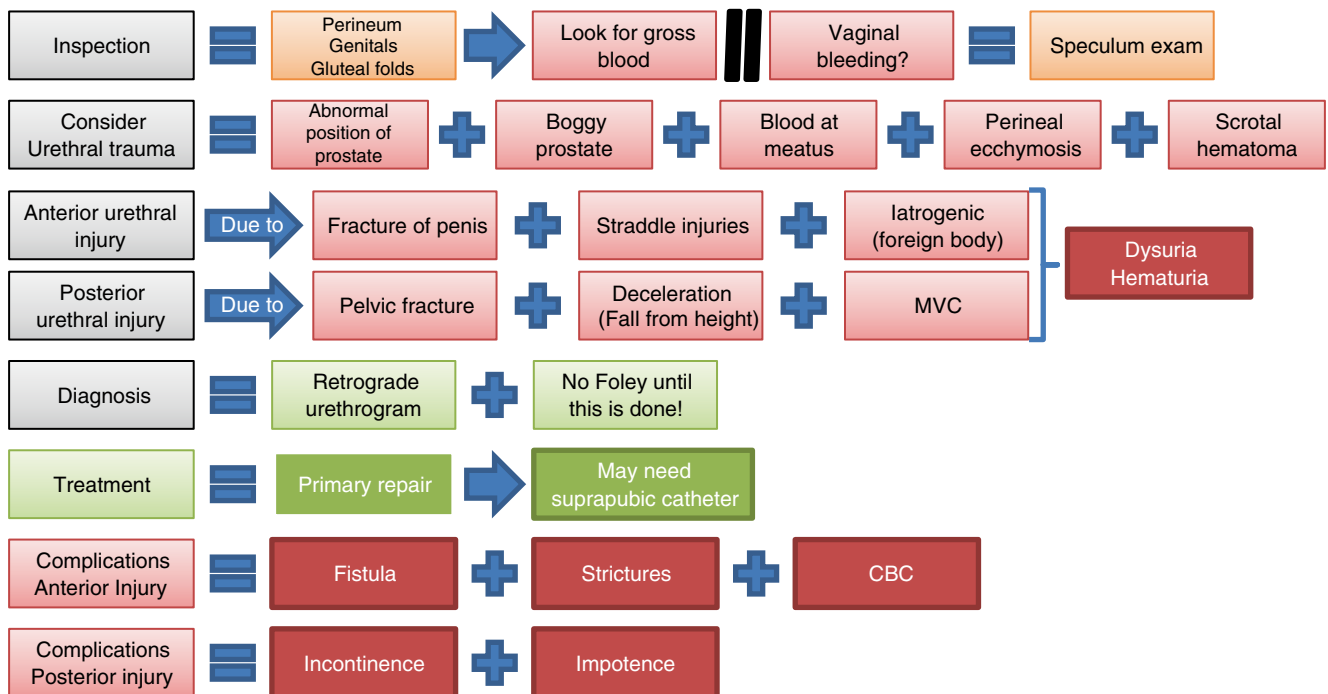
Kidney Injuries



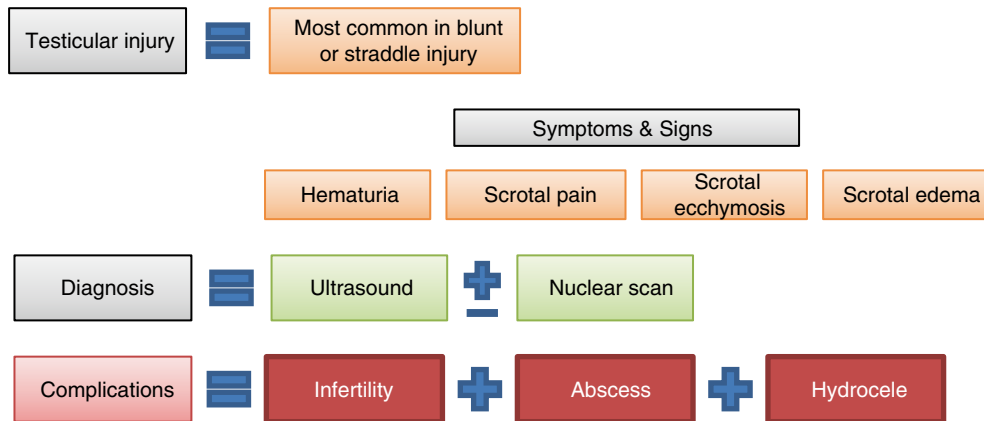
Genitourinary Injuries: Bladder and Ureter Injury



Genitourinary Injuries: Urethral Injury

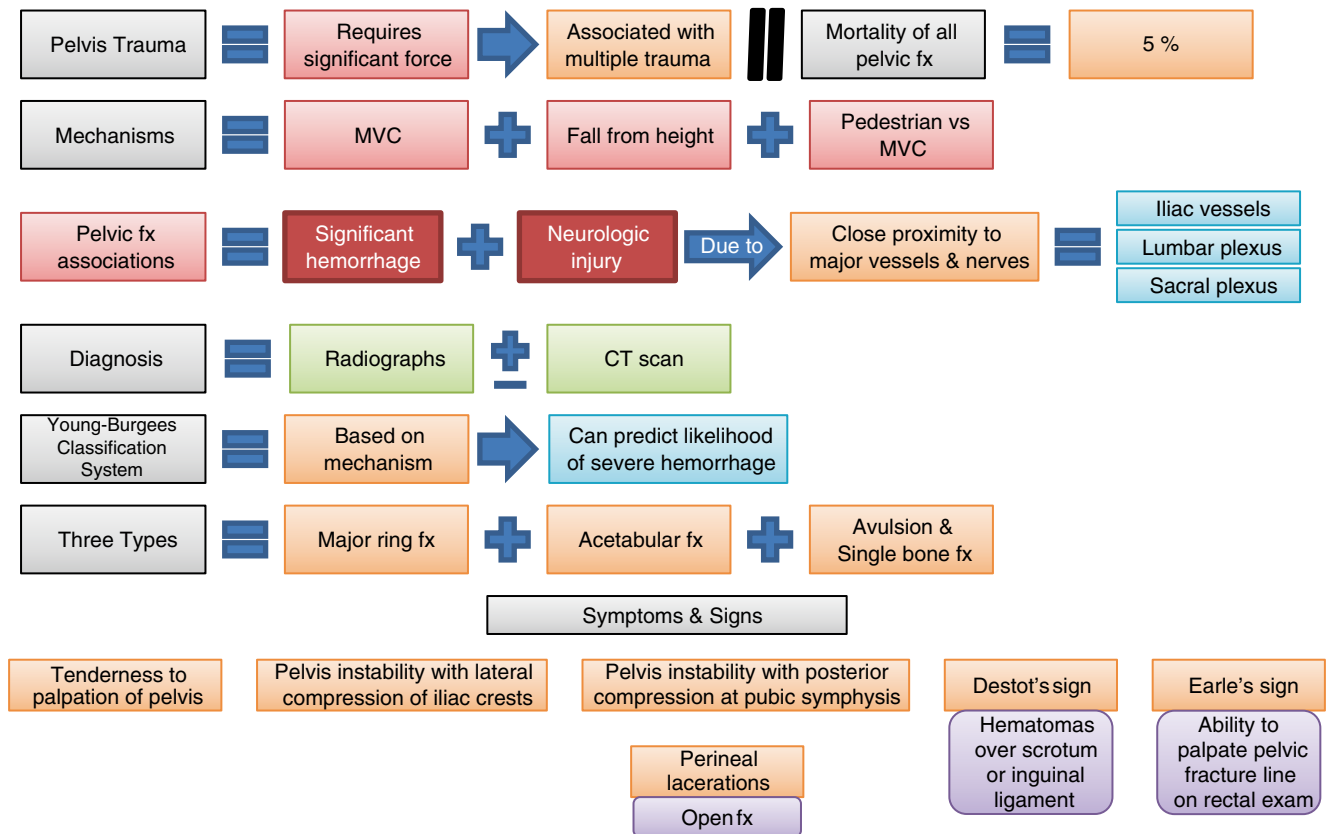


Genitourinary Injuries: Testicular Injury

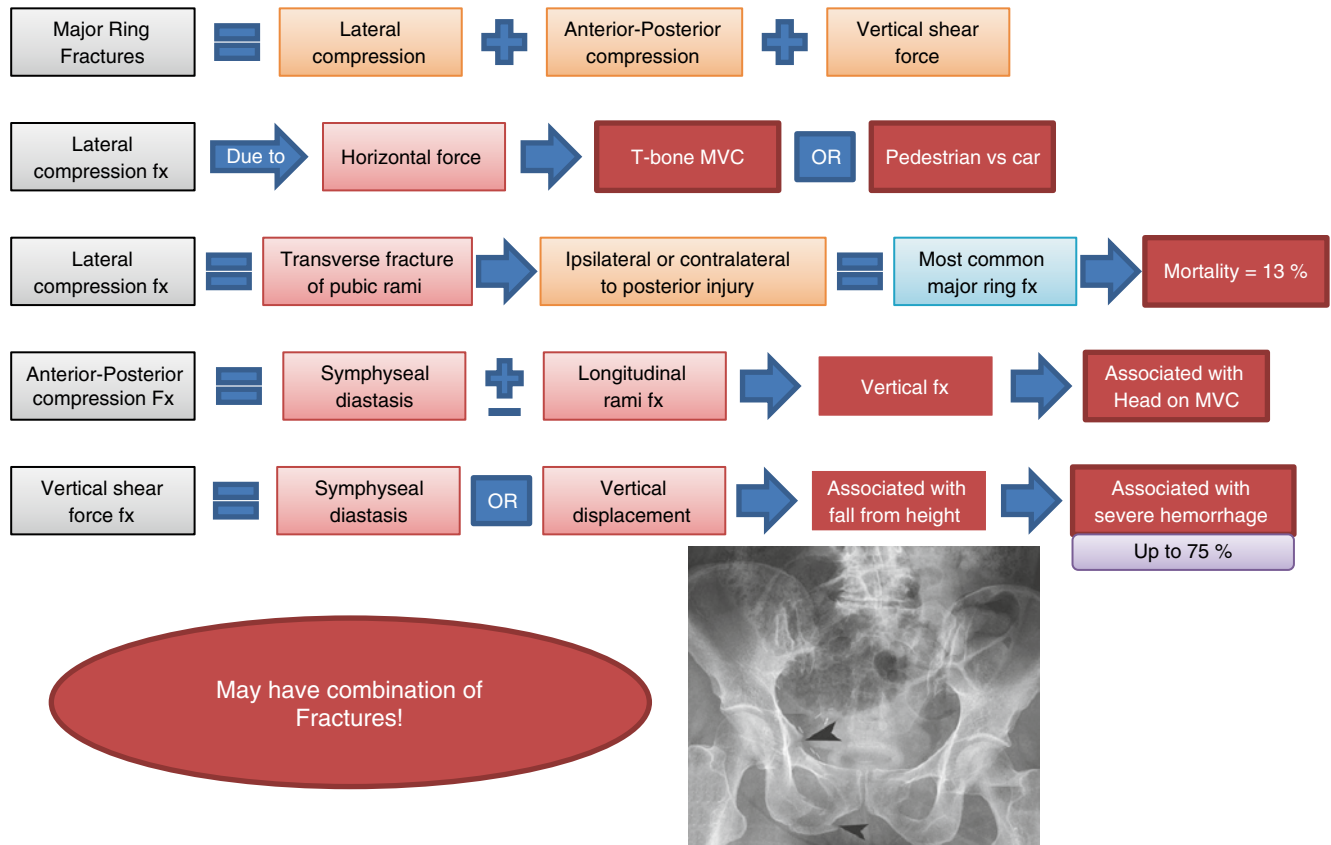


Pelvis and Hip Trauma

Introduction

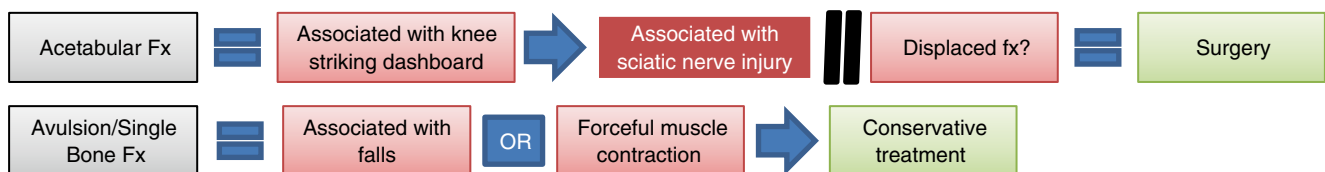


Major Ring Fractures



Center bottom image (Reprinted from Kaewlai R, Singh A. Lower extremity trauma. In: Singh A, editor. Emergency radiology: imaging of acute pathologies. New York: Springer Science; 2013. p. 277–98. With permission from Springer Science + Business Media)

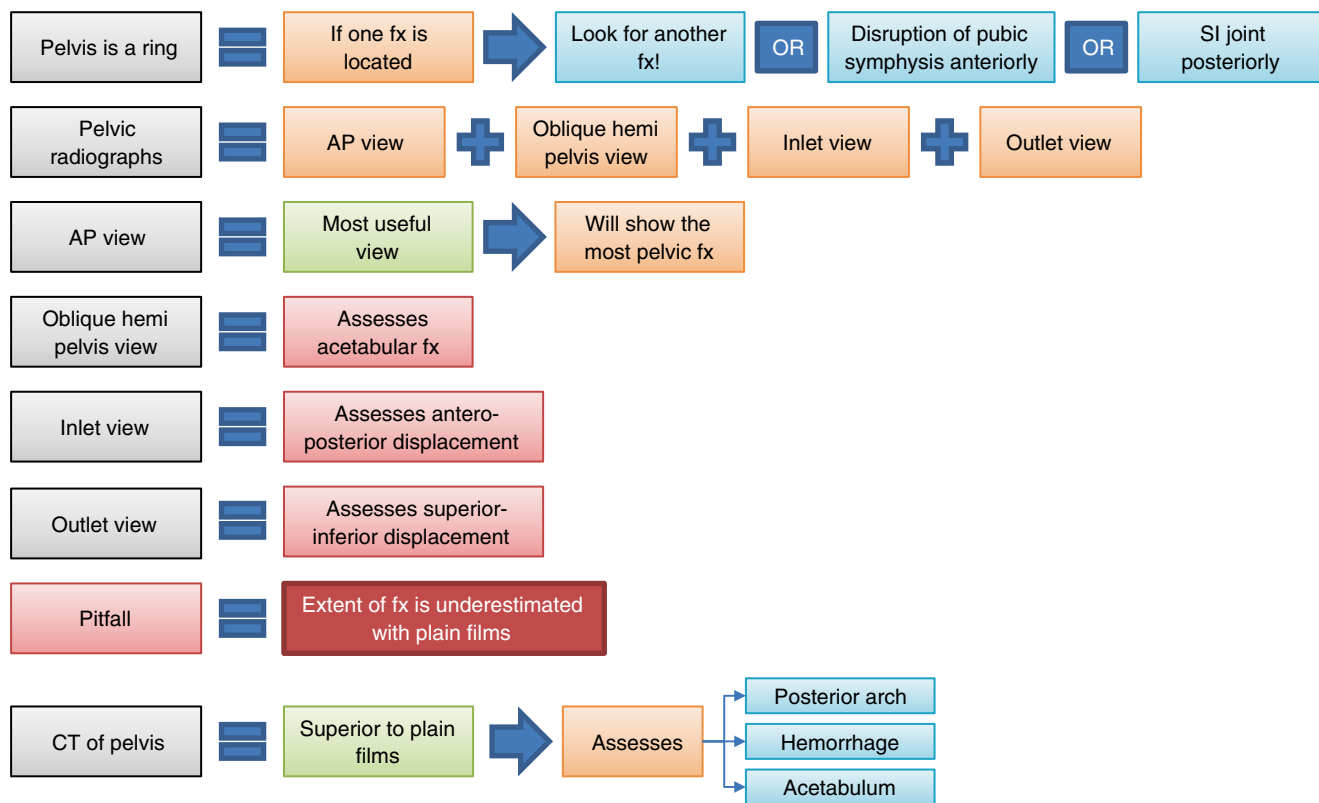
Acetabular and Avulsion/Single Bone Fx



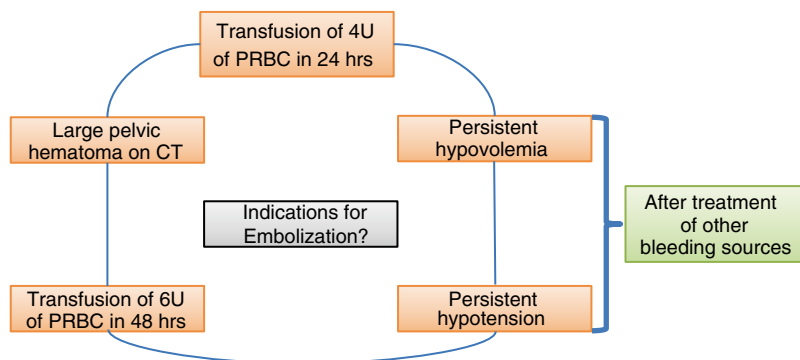
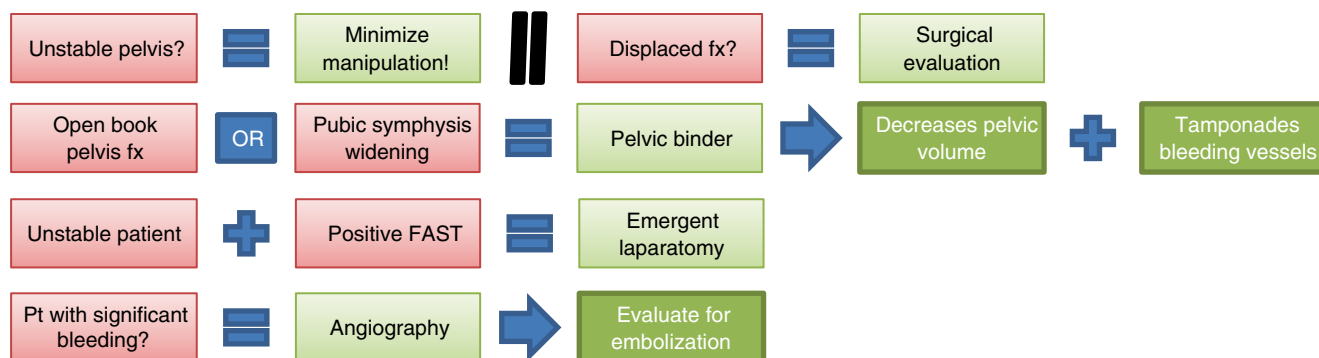
Center image (Reprinted from Zamora-Carrera E, Rubio-Suarez JC. Complex fractures of the acetabulum. In: Rodríguez-Merchán EC, Rubio-Suarez JC, editors. Complex fractures of the limbs. Zug:

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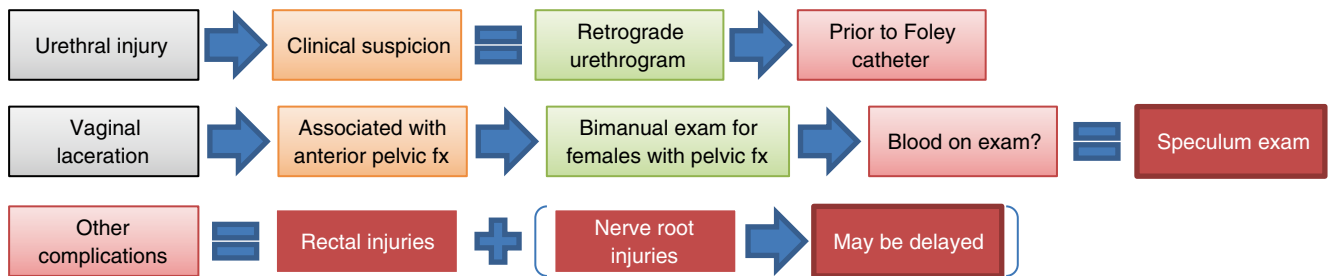
Pelvic Radiograph Tidbits



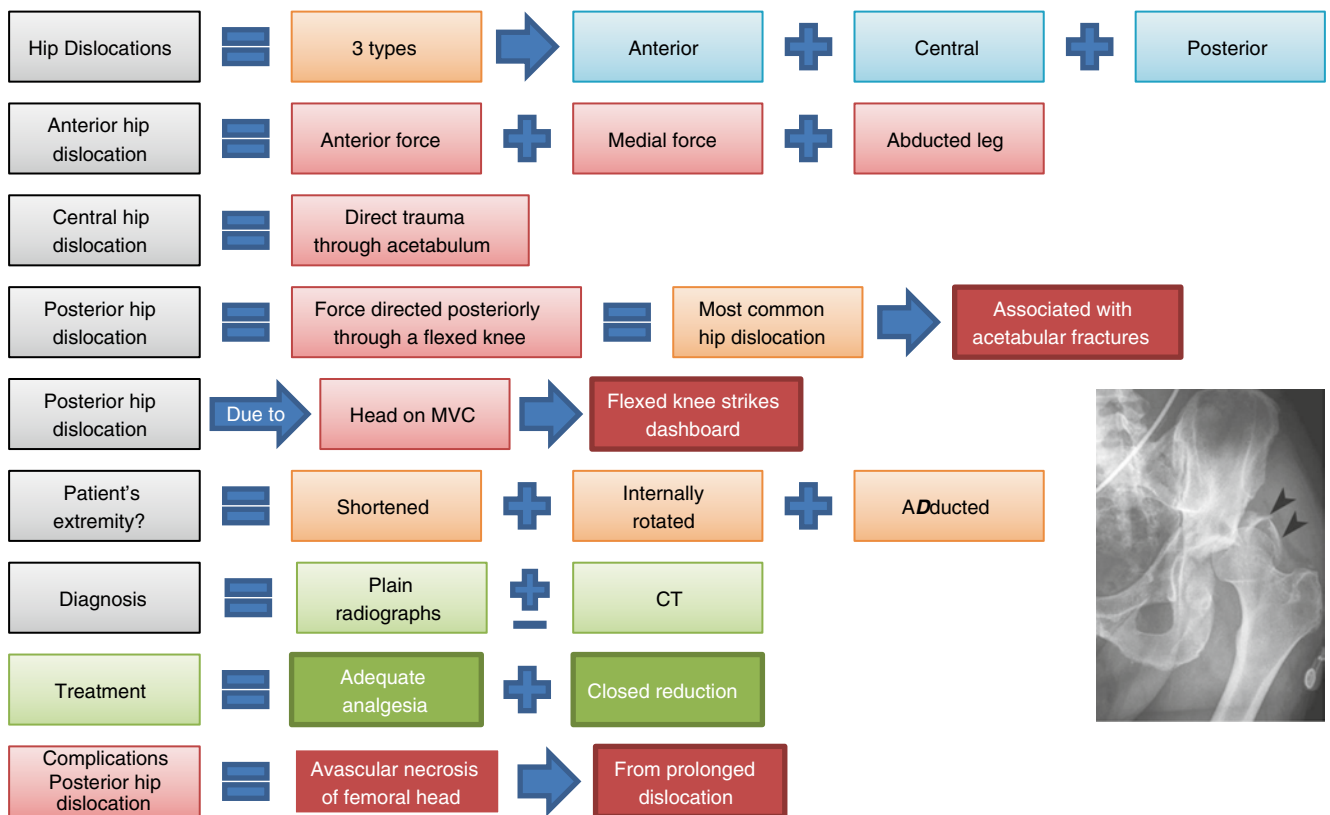
Treatment of Pelvic Fractures



Complications of Pelvic Fractures



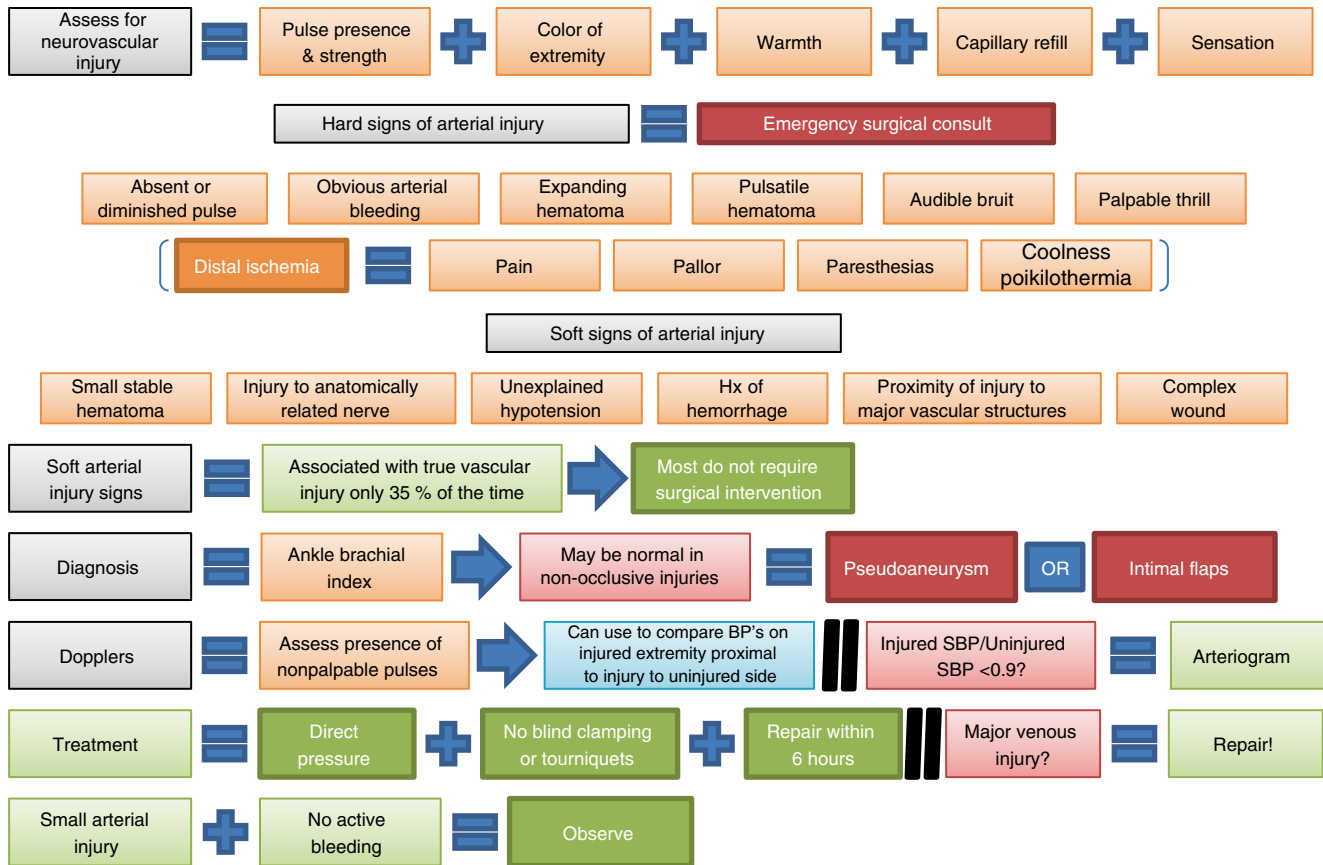
Hip Dislocation Introduction



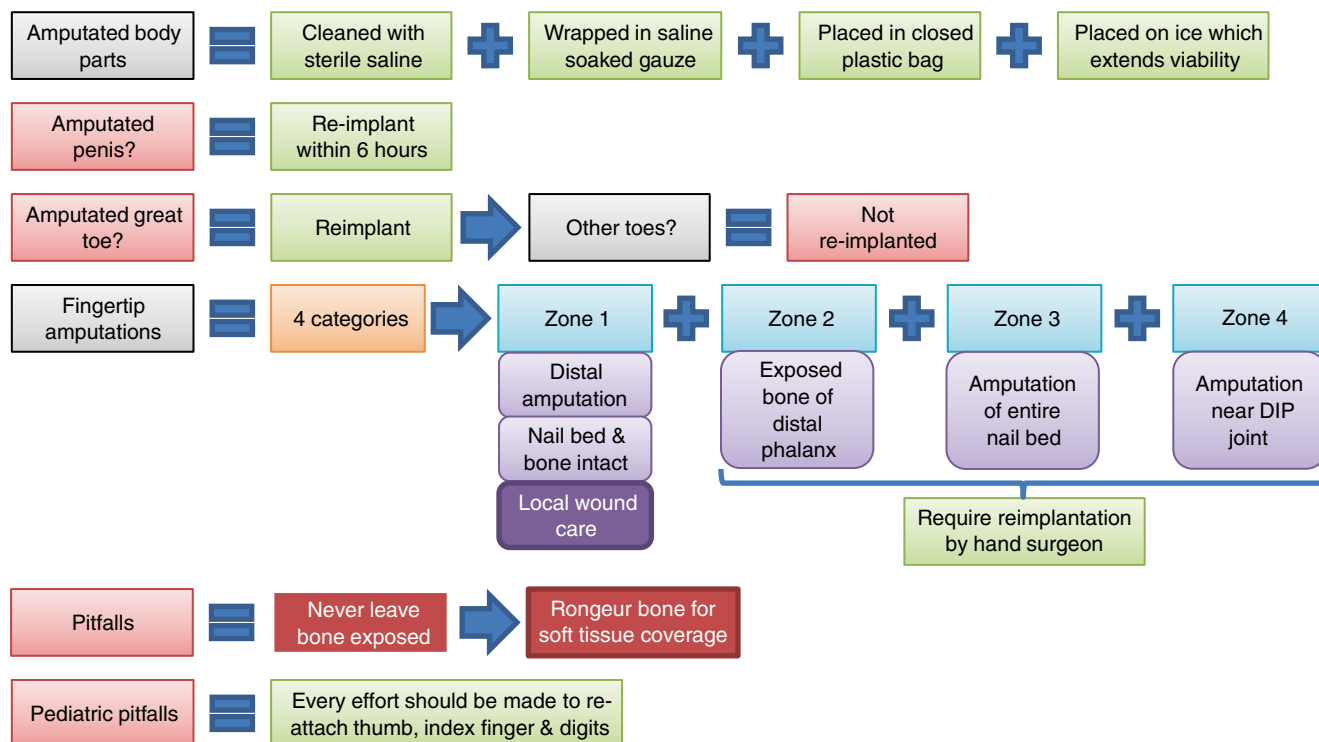
Bottom right image (Reprinted from Kaewlai R, Singh A. Lower extremity trauma. In: Singh A, editor. Emergency radiology: imaging of acute pathologies. New York: Springer Science; 2013. p. 277–98. With permission from Springer Science + Business Media)

Extremity Injuries

Introduction



Amputations

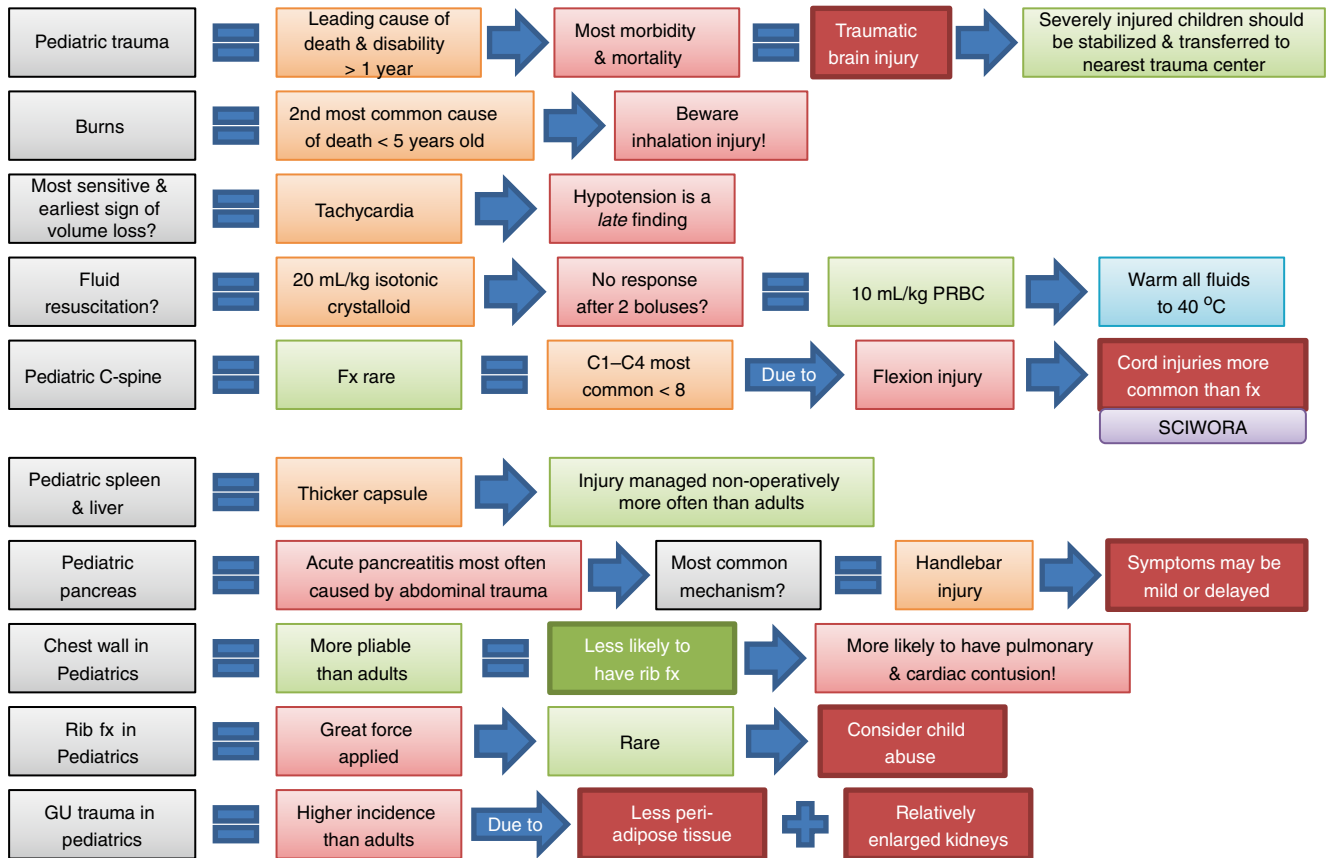


Trauma in Special Populations

Pediatric Trauma

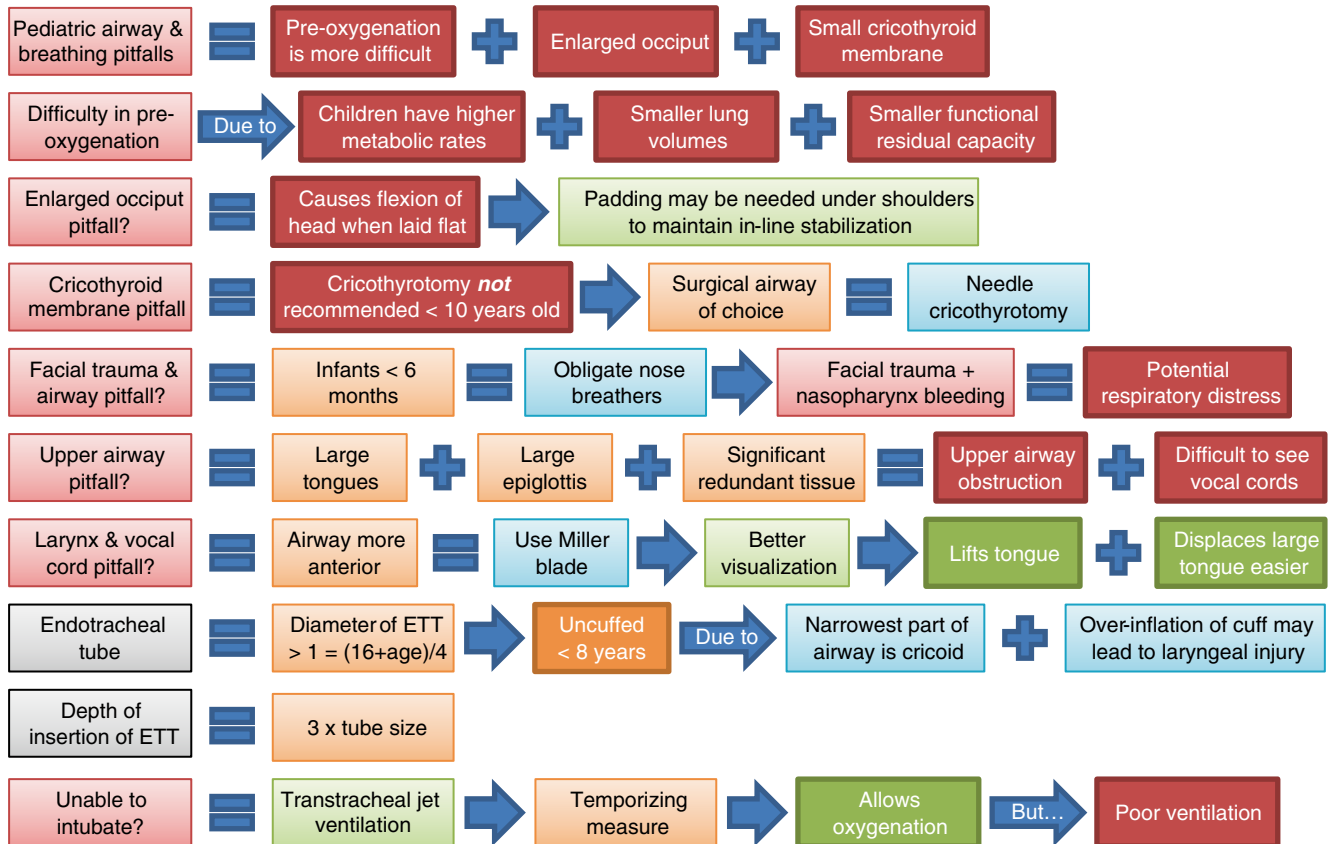
Pediatric Trauma Tidbits

PEDIATRICS

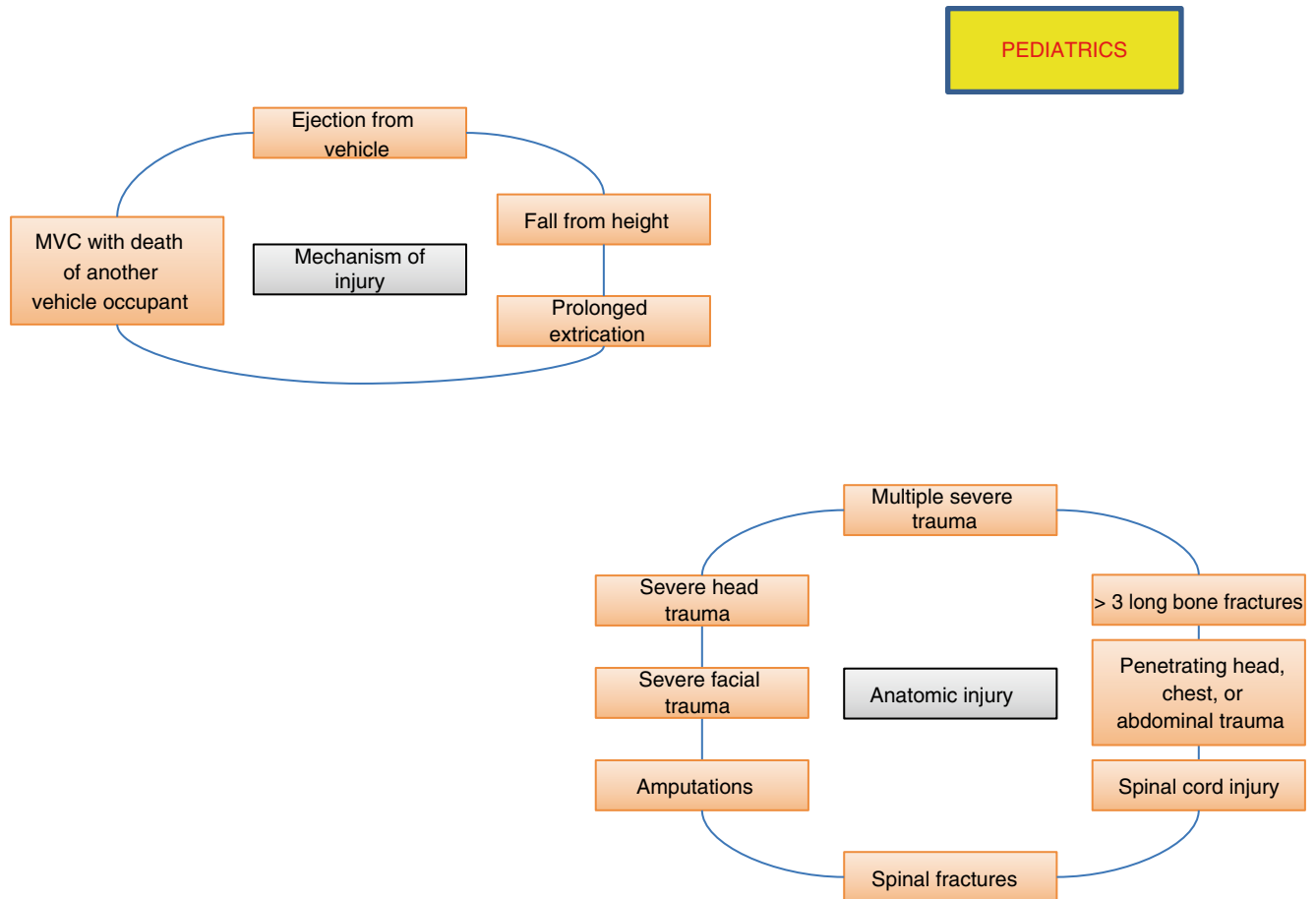


Pediatric Trauma Airway and Breathing

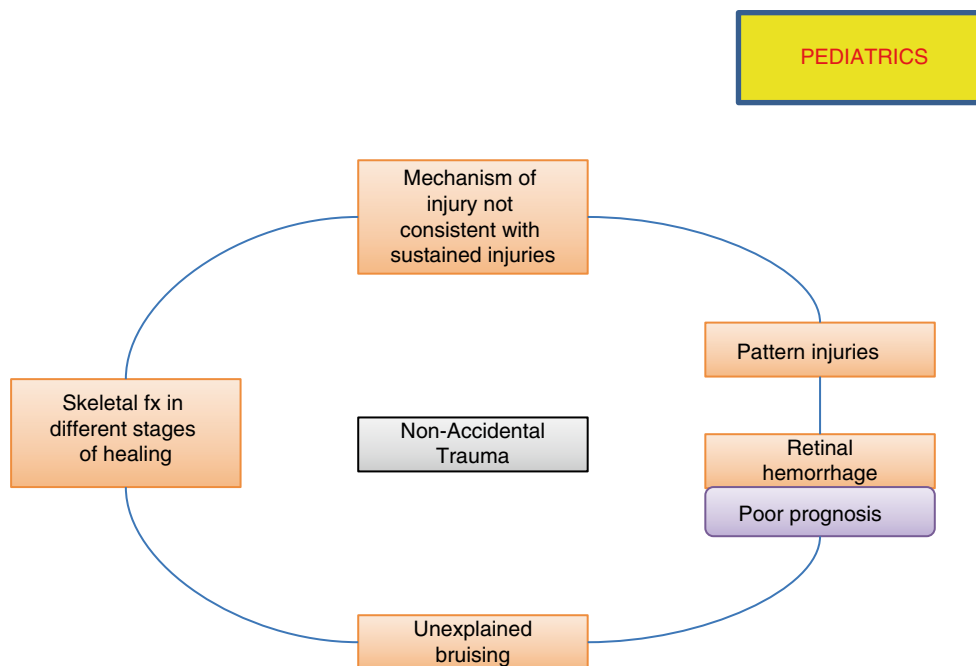
PEDIATRICS



Indications for Transfer to Pediatric Trauma Center

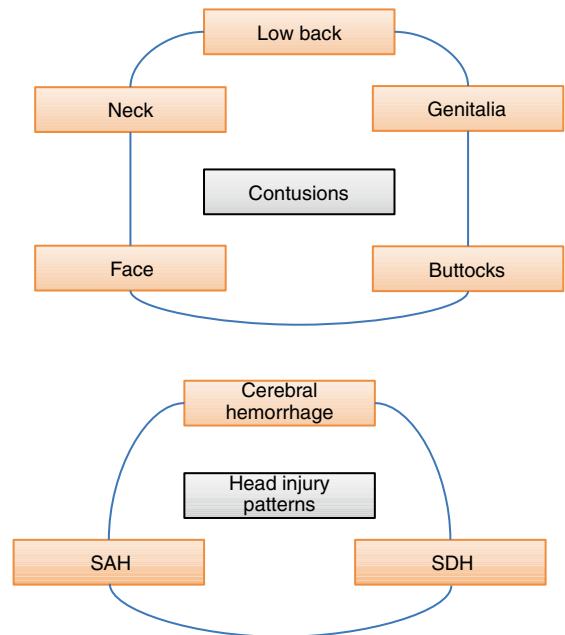
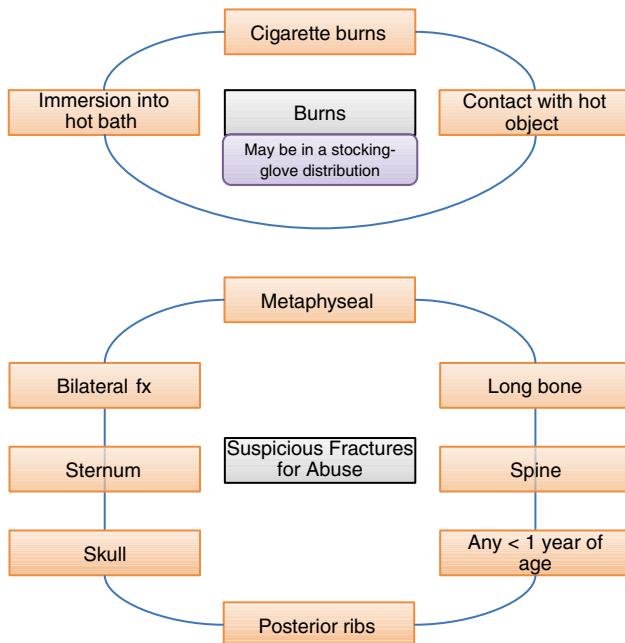
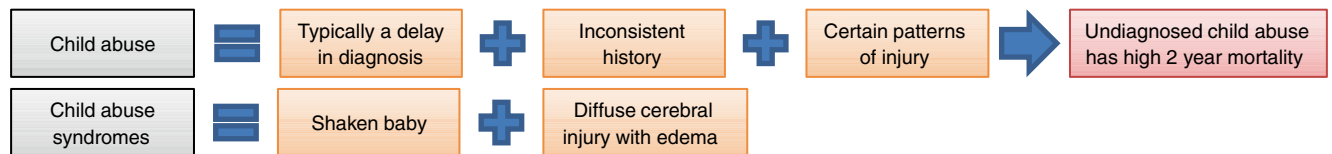


Nonaccidental Trauma



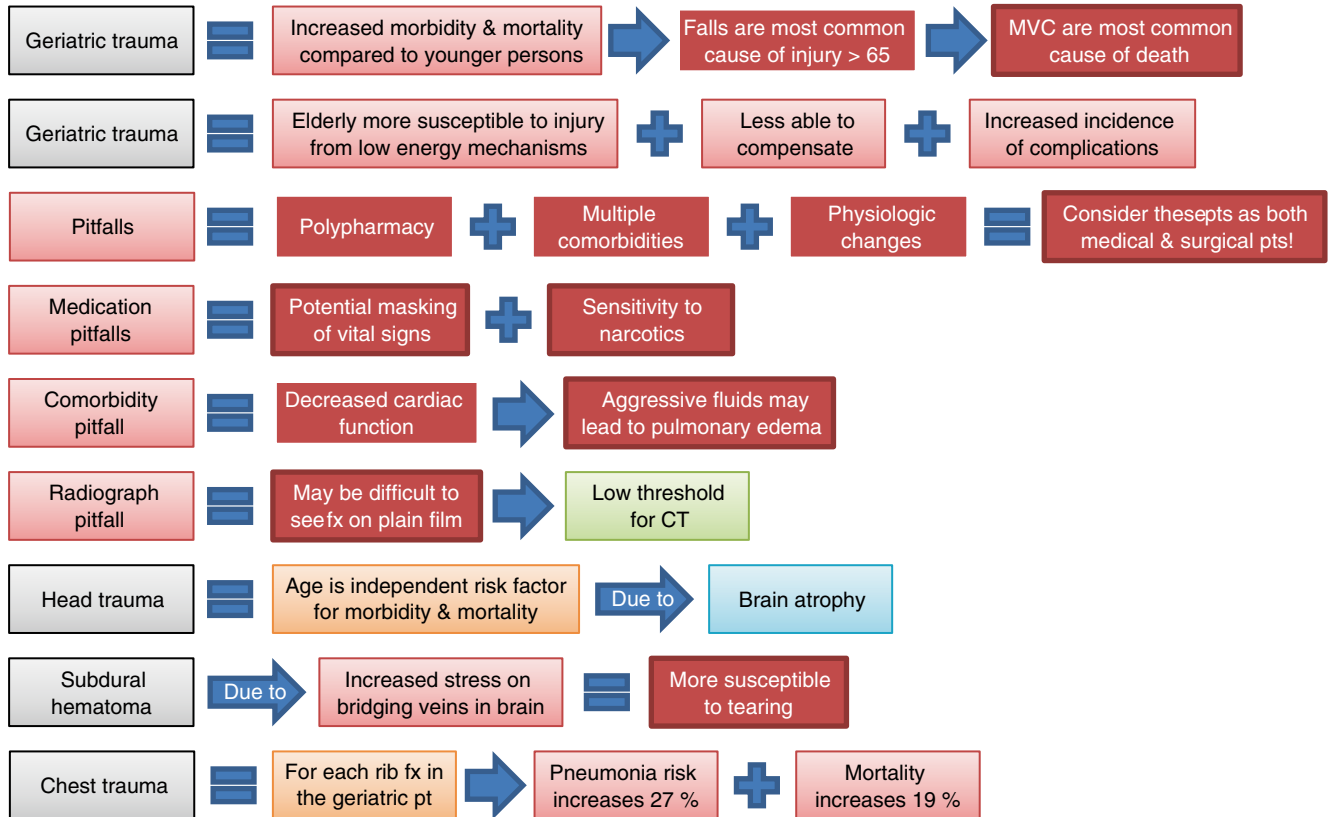
Child Abuse

PEDIATRICS



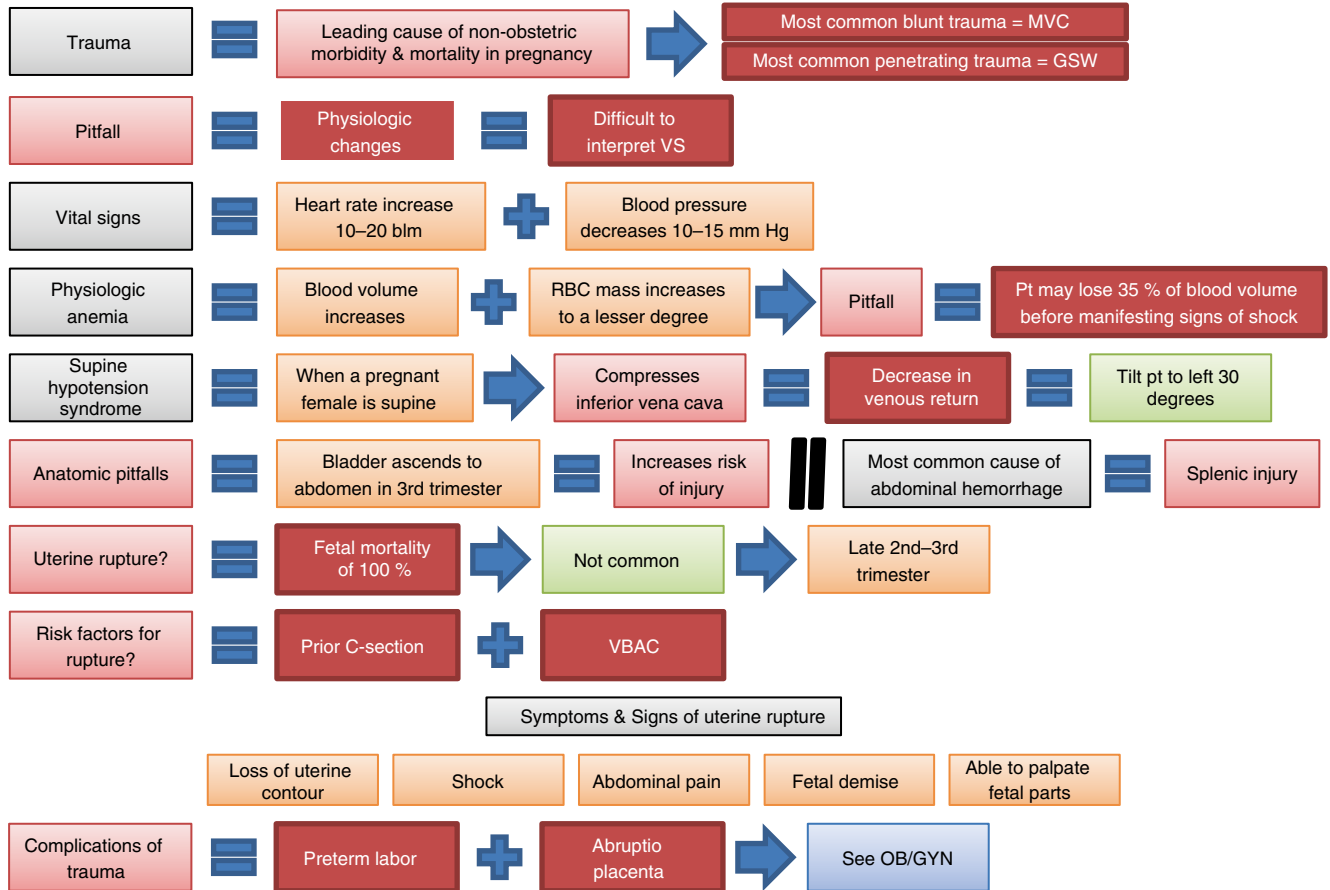
Geriatric Trauma

Geriatric Trauma Introduction

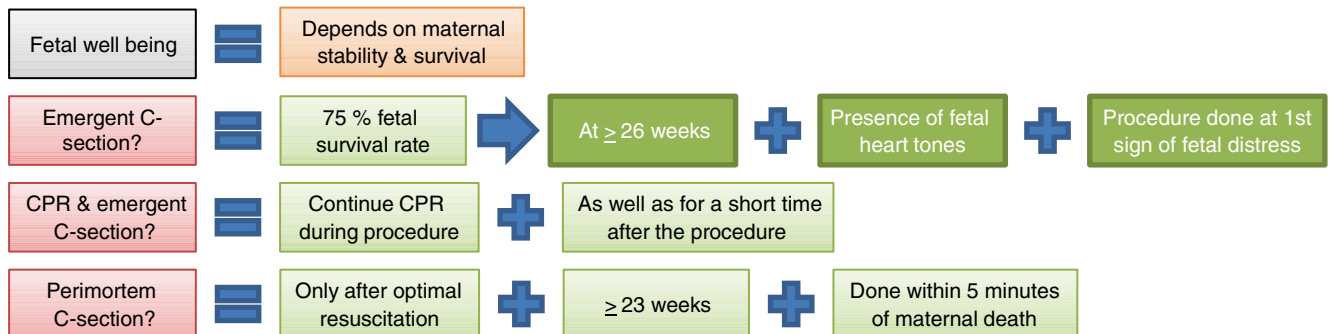


Trauma in Pregnancy

Introduction

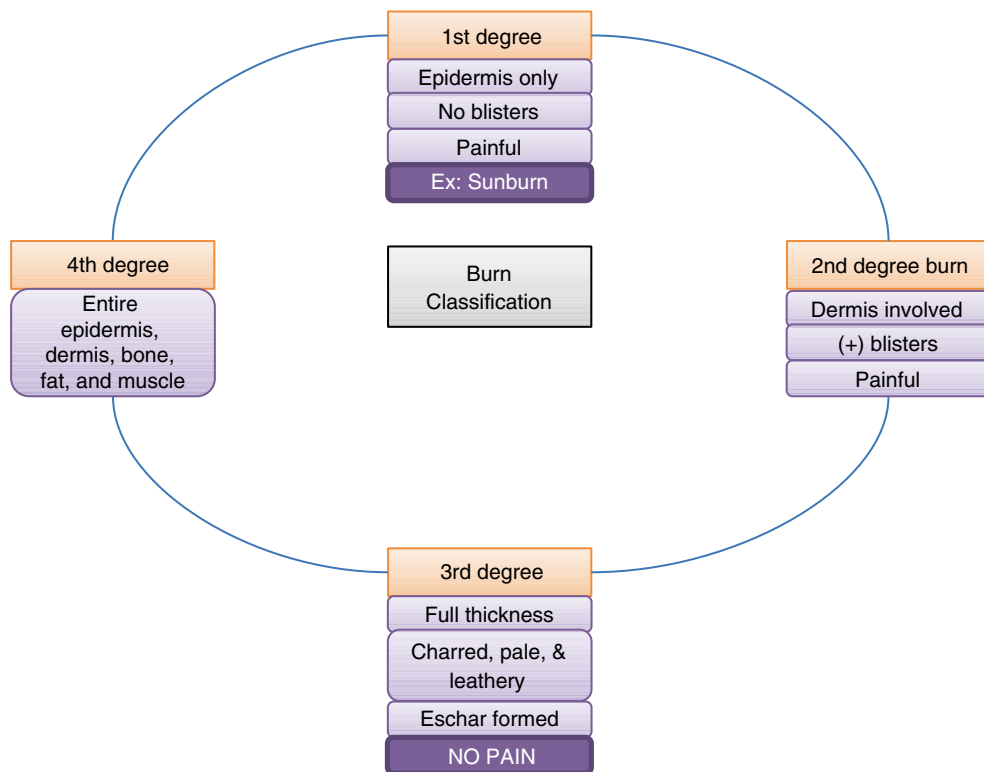


Maternal-Fetal Well-Being

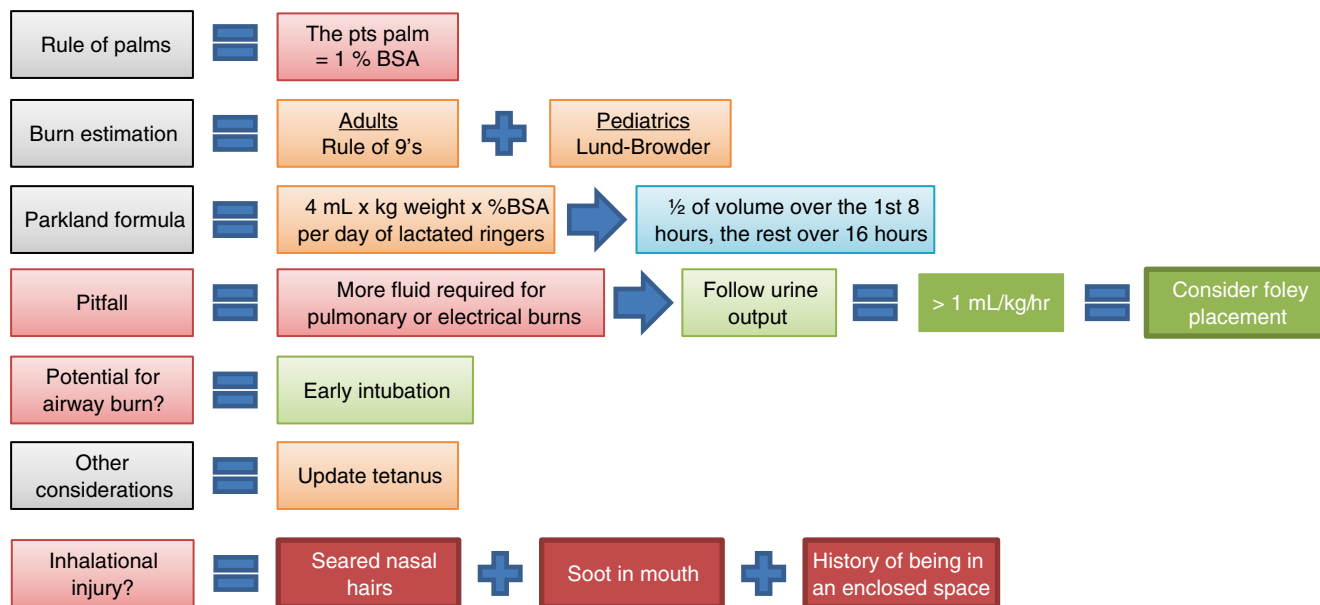


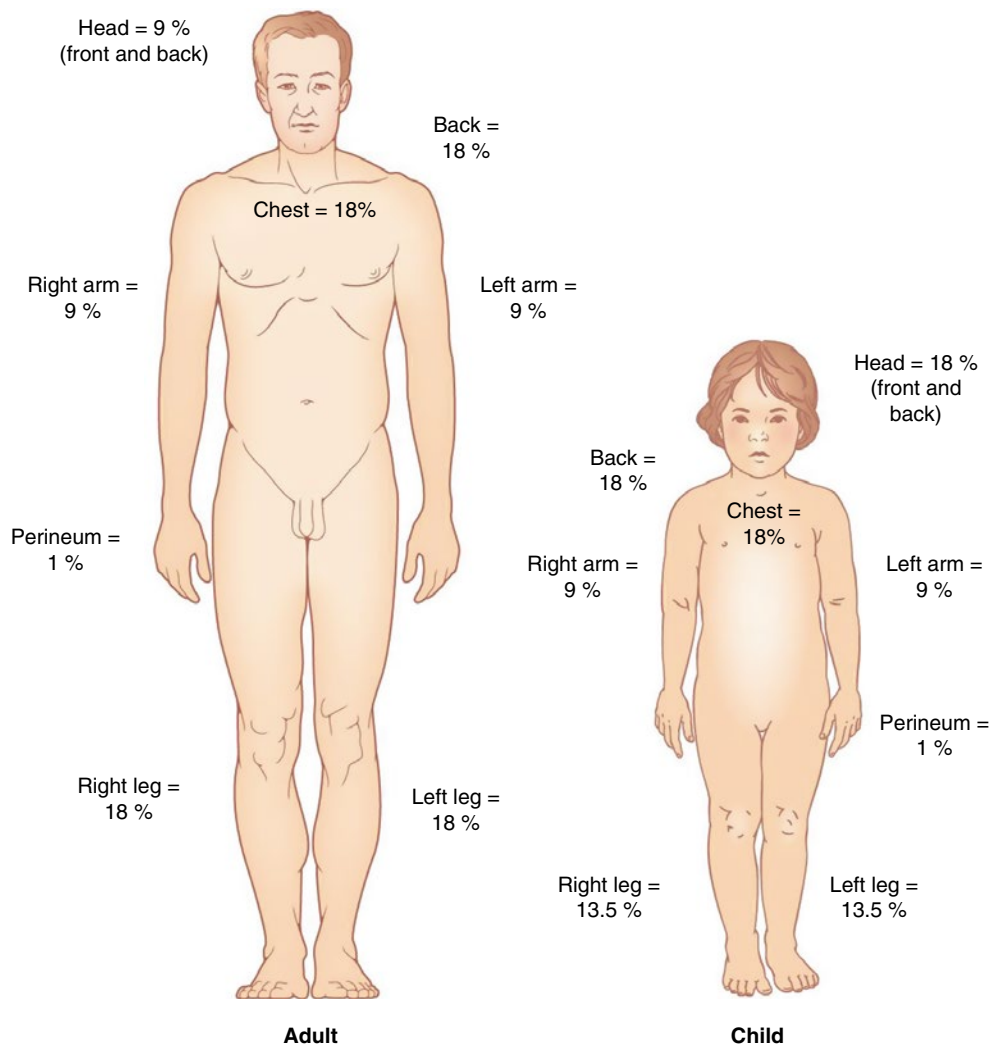
Burns

Burn Classification



Burn Tidbits

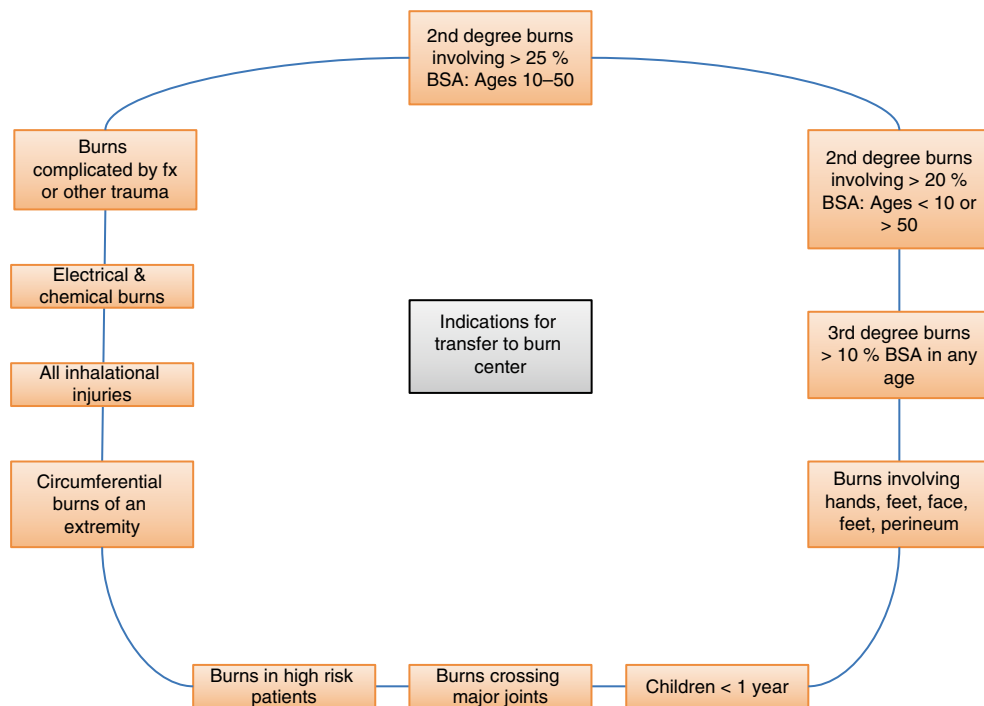


Burn Estimation

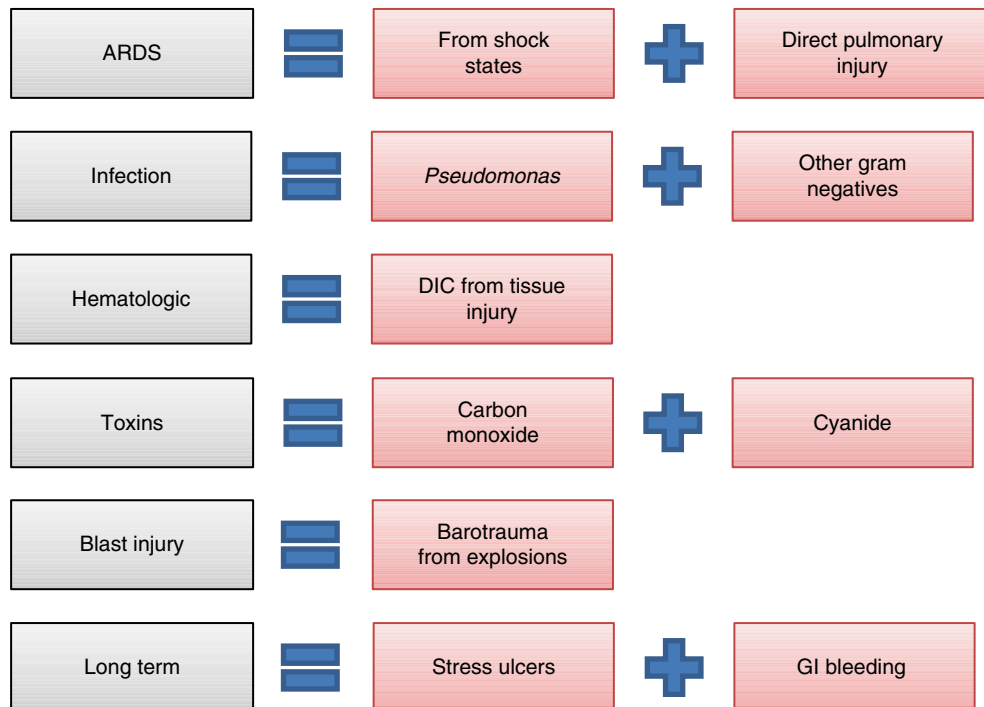
Parkland formula = LR 4ml/kg/% burn TBSA in
first 24 hrs + maintain fluids w/half in first 8 hrs + second half in last 16 hrs.

Center image (Reprinted from Allen B, Ganti L, Desai B. Trauma and ATLS. In: Allen B, Ganti L, Desai B, editors. Quick hits in emergency medicine. New York: Springer Science; 2013. p. 37–45. With permission from Springer Science + Business Media)

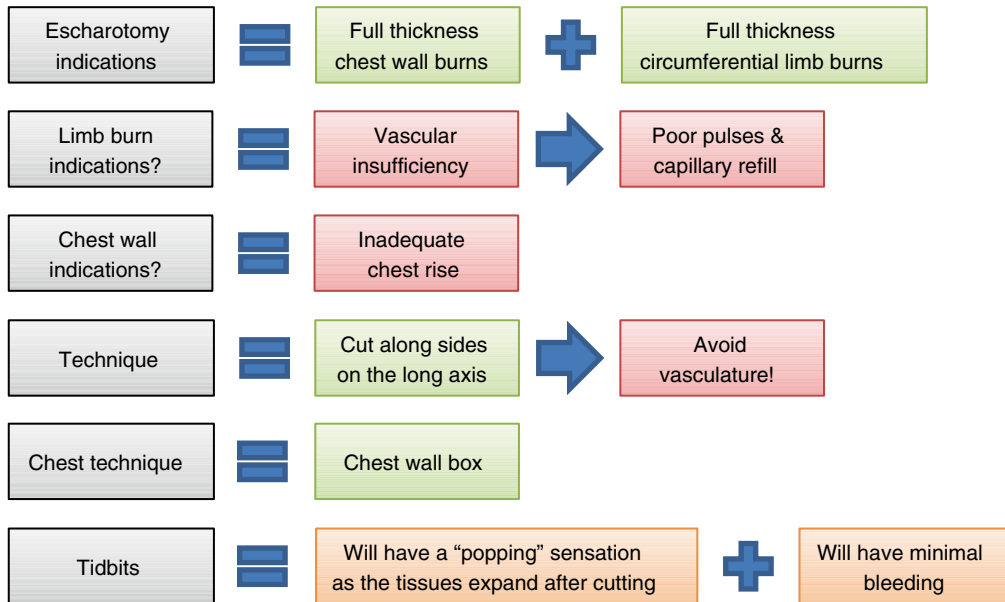
Indications for Transfer to Burn Center



Burn Complications



Escharotomy

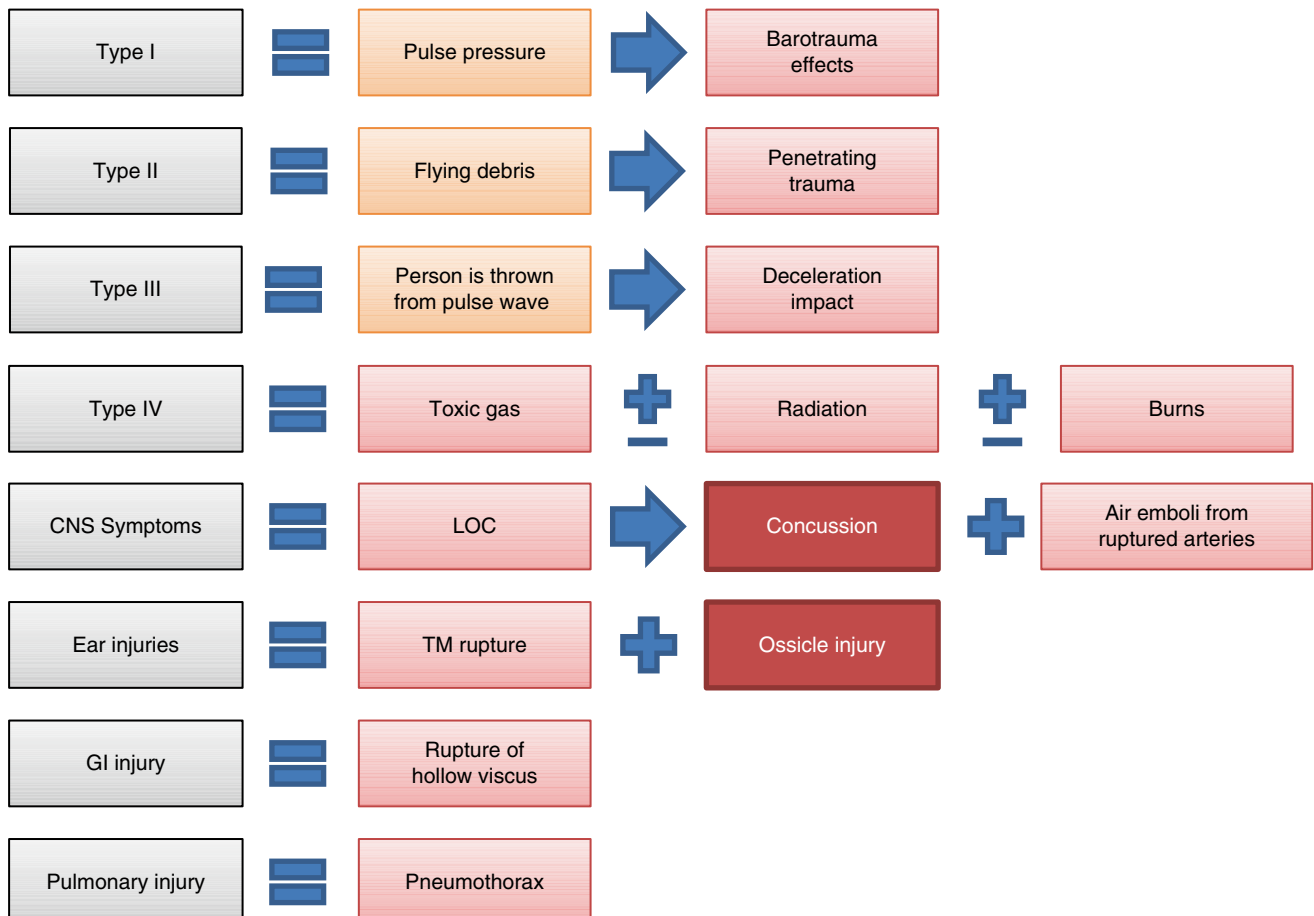


Center right image (Reprinted from Sjöberg F. Pre-hospital, fluid and early management, burn wound evaluation. In: Jeschke MG, Kamolz L-P, Sjöberg F, Wolf SE, editors. Handbook of burns: acute burn care

volume 1. Vienna: Springer-Verlag/Wien; 2012. p. 105–16. With permission from Springer-Verlag/Wien)

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Blast Injury Classification



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